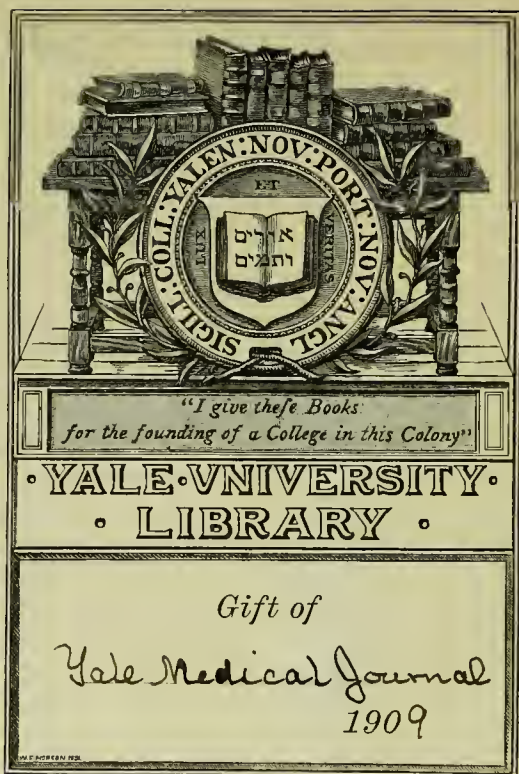


*The* SELF=CURE *of*  
CONSUMPTION



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By **GEO. M. BEARD, A.M., M.D.,**

*Graduate of Yale College, and of the New York College of Physicians  
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**NEW YORK**

THE SELF-CURE OF  
CONSUMPTION  
WITHOUT MEDICINE

WITH

A CHAPTER ON THE PREVENTION OF CONSUMPTION AND  
OTHER DISEASES

BY

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## PREFACE.

CONSUMPTION is the most wide spread of all diseases, as shown by the statistics of the various boards of health. It is the most costly of all diseases. It is the most important economic problem that confronts the American people.

In New York City there are at least 20,000 people walking the streets each day affected by consumption, and carrying the possibility of infection to the other people of the city, while the death rate each year from consumption in New York State is over 13,000. In the United States there are 1,250,000 cases of consumption, with more than 150,000 deaths from the disease every year. The annual expense of consumption to the people of the United States is placed at \$330,000,000.

One of the noteworthy advances for which the twentieth century promises to be distin-

guished is the practical suppression of the disease. There is not a shadow of doubt but that consumption can be practically stamped out, as has been typhus fever, Asiatic cholera, yellow fever, leprosy, and smallpox. The civilized world is being aroused by the necessity of vigorous and well-directed action against the continuous spread of this disease, as well as towards its cure.

The idea that consumption is an incurable disease is still widely prevalent among the people, but there is no reason why any person, not advanced beyond the second stage, should die of the disease.

The object of this book is to show how consumption from its first beginnings to its last stages, before actual decay of the lungs takes place, can be cured in at least ninety-five per cent. of the cases, and this without the use of medicine.

C. H. S. D.

Meriden, Conn., December, 1903.

# CONTENTS.

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CHAPTER	PAGE
I. Consumption and its Fatality.....	11
II. What Causes Consumption.....	17
III. Heredity.....	28
IV. Symptoms and Diagnosis of Consumption.....	33
V. The Treatment of Consumption with Drugs....	42
VI. How Consumption can be Cured.....	59
VII. The Open-Air Treatment of Consumption.....	63
VIII. How to Breathe Properly.....	69
IX. The Proper Diet for Consumptives.....	75
X. Exercise for Consumptives.....	96
XI. Change of Climate for Consumptives.....	101
XII. The Sanatorium Treatment of Consumption....	111
XIII. Hygienic and Prophylactic.....	122
XIV. The Cough of Consumptives.....	129
XV. The Hemorrhage of Consumption.....	133
APPENDIX I. The Prevention of Consumption and other Diseases.....	137
APPENDIX II. Nutritive Value of Animal and Vegetable Food .....	171



## SELF-CURE OF CONSUMPTION.

*"After one has worked for a time in healing wounds which should never have been inflicted, tending illness which should never have developed, sending patients to hospitals who need not have gone if their homes were habitable, bringing charitable aid to persons who would not have needed charity if health had not been ruined by unwholesome condition, one loses heart and longs for preventive work, constructive work—something that will make it less easy for so many illnesses and accidents to occur, that will help to bring better homes and workshops, better conditions of life and labor."\** And this expressed longing finds its echo in the heart of each of us who has learned by experience that the faithful nursing of the patient, the splendid work done in so many forms of philanthropy and the efforts of religion do not reach the root of the matter. In your professional life you have learned that we may dress and nurse a wound ever so carefully, but that all your work represents time and energy expended in vain, that a breakdown of the wound is inevitable, did not the surgeon first clean and scrape away all the diseased tissues, reaching deep down into the fresh, healthy part until no germ of disease was left to impair the growth of new, healthy flesh. And so it is with our work in caring for humanity in other ways—we are but staying a worse condition, perhaps, but not removing the cause if we rest satisfied with mere treatment and do not direct our best energies towards prevention.

---

\* Miss Dock, in the "American Journal of Nursing"; and quoted by Miss Isabel H. Robb, Cleveland, Ohio, in addressing the graduating class of the John Hopkins Hospital Training School for Nurses, May 28th, 1903.

# THE SELF-CURE OF CONSUMPTION.

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## CHAPTER I.

### CONSUMPTION AND ITS FATALITY.

CONSUMPTION, pulmonary tuberculosis, decline, phthisis, and marasmus, are terms which have been applied to a very grave malady or disorder that has always been considered incurable. The most common form of consumption is that of the lungs, called pulmonary tuberculosis, though it is by no means confined to that organ. Tuberculosis of the stomach, bowels, joints, brain, etc., is not infrequently met with.

Amongst diseases it is the most frequent and the most fatal known to civilization; in fact, it is the destroying angel who claims a fourth part of all who die. Ravages of the plague, small-pox and cholera dwindle into insignificance

when compared with those of consumption in its manifold forms. These come only as epidemics occasionally, but consumption carries off its victims by the thousands every year. Yet it is a disease which may be largely prevented. The germ of consumption abounds everywhere. We cannot avoid it. It enters our household like a thief in the night, and takes from us the fairest of the number.

For more than 2,000 years consumption has been the most relentless and unconquerable disease for the human race. Four hundred years before the Christian era, Hippocrates portrayed the symptoms of consumption as clearly as they are portrayed to-day. His efforts to cure or materially alleviate the disease were as powerless as have been the efforts of the thousands of physicians since. There are doubtless many practitioners to-day who have less knowledge of consumption than was taught by Hippocrates.

If in any one year a State lost from 5,000 to 10,000 persons from cholera or the plague, there would occur such a panic that the State would be partly depopulated, and many of its indus-



tries paralyzed. Yet there are States which lose every year over 5,000 of its citizens, like Pennsylvania, for instance, from consumption, and these citizens nearly all in the prime of life. In Massachusetts during forty years over 200,000 persons died from consumption, and at present fully 4,000 deaths are annually attributed to it. In New York State, approximately, 50,000 cases and 13,000 deaths occur from consumption annually. In 1902, 7,571 persons died of the disease in New York City, while 1,312 died from other forms of tuberculosis. According to Dr. Biggs, more than one-half of the entire adult population of New York City acquires the disease at some time during life. In New York City alone last year there were 57 per cent. more deaths from this disease than from scarlet fever, diphtheria, typhoid fever, and all forms of diarrhœal diseases, exclusive of cholera infantum. In Boston two years ago there were seventy-nine more deaths from consumption than from measles, scarlet fever, diphtheria, croup, whooping cough, typhoid fever, cerebrospinal meningitis, cancer, and appendicitis combined. Professor Osler of Johns Hopkins Uni-

## 14 THE SELF-CURE OF CONSUMPTION.

versity estimates that there are over 1,250,000 cases of consumption in the United States at all times, with more than 150,000 deaths from the disease. Every day over 3,000, and each minute of the day three persons die of the disease. It is estimated that at the present death rate from consumption, 10,000,000 or more of the 75,000,000 people now living in the United States will die of this disease.

A paper published in Virchow's *Archives* in May, 1900, maintained that 99 per cent. of the human race who attained the age of thirty show, on post-mortem, lesions of tuberculosis. The result of five hundred post-mortem examinations of persons dying from various diseases in one of the large hospitals showed that

1. Tuberculosis during the first year of life is very seldom found.
2. From the 1st to the 5th year it was infrequent, but almost regularly fatal.
3. From the 5th to the 14th year one-third of all bodies were found to be tuberculous.
4. From the 14th to the 18th year tubercular lesions, active or latent, are found in one-half of all autopsies.

5. From the 18th to the 30th year 97 per cent. of all show tubercular changes.

6. After the 30th year, with careful search, indisputable evidence of tuberculosis is found in over 99 per cent. of all autopsies. From this it would seem that almost every one is infected with tuberculosis at some time or other. In fact, few people die, after 40, who have not in the lungs the signs of having had tuberculosis without ever having had the slightest suspicion of the existence of the disease, and who finally die of maladies having no approximation towards it in nature. These signs are scars of various lengths, little excavations, or cavities or puckerings of various sizes; all very small, it is true, but still showing the great fact that decay once existed there, and that the lungs may perfectly heal after having been diseased.

The expense of tuberculosis to the people of the United States, after careful estimation by Dr. Biggs, of New York, is placed at \$330,000,000. He first calculated the loss to New York City by putting a value of \$1,500 upon each life of the average age at which deaths from tuberculosis occur. This gives a total

value of the lives lost annually at \$1,500,000. But this is not all, for at least nine months prior to death these patients cannot work, and the loss of services at \$1.00 a day, together with food, nursing, medicines, attendance, etc., at \$1.50 a day, results in a greater loss of \$8,000,000, making a yearly loss to the municipality of \$25,000,000. For the whole country the 150,000 deaths from tuberculosis represent in the same way a loss of \$330,000,000.

## CHAPTER II.

### WHAT CAUSES CONSUMPTION.

It is admitted by all persons who are at all conversant with what has been done in the world of science during the last few years, that many diseases are caused by germs. Tuberculosis, typhoid fever, tetanus or lockjaw, Asiatic cholera, yellow fever, syphilis, glanders, diphtheria, etc., are now known to be caused by the presence of distinct species of germs, differing in form, size, mode of growth, microscopic appearance, etc. It is supposed also that measles, scarlet fever, smallpox, cancer, etc., are also caused by germs.

Until a few years ago the cause of tuberculosis was unknown; but within the past few years a great light has been thrown upon this and other kindred diseases. Up to 1882, tuberculosis was supposed to be a specific infectious dis-

ease, but in that year Dr. Robert Koch made the discovery that changed the thought of the scientific world. By the aid of the microscope he was able to prove the existence of a germ or bacillus, a micro-organism capable of causing death in its most certain and dreaded form. The most thorough investigation and exhaustive experiments by the ablest bacteriologists have not been able to refute his arguments or discredit his discovery. As Dr. Koch says: "The bacilli are not only the cause of tuberculosis, but they are the only cause of it; and there is no tuberculosis without bacilli." It follows, therefore, as a necessary result from his discoveries, *that tuberculosis is an absolutely preventable disease.*

It is this very small living thing, then, called the *bacillus tuberculus*, or tubercle bacilli, which causes consumption. It is a little, colorless rodlike plant, so small that many thousands of them piled together would make a heap still far too small to be visible to the naked eye. This parasite not only gradually destroys the lung substance through the process of ulceration, but at the same time gives off certain pois-

onous substances called toxins which give rise to various and often serious and distressing symptoms. The germ of consumption, the tubercle bacilli, does not exist in the body of men or animals in health. *Without the entrance of this particular germ into the human body from without, tuberculosis cannot develop in it. Without the transmission of this germ in some way or other in a living condition from the sick to the well, tuberculosis cannot spread.*

The bacillus of tuberculosis gains entrance to the body with the food, and by direct inoculation, but most commonly by inhalation, and in consequence, the lungs are the most frequent seat of the disease. The tubercle bacillus cannot be given off into the air from the breath so that neither the person nor the breath of the consumptive is the direct source of danger, even to his most constant or intimate attendants, for the moist surface of the mouth and air passages serve as a protection, and it is known that while the sputum is moist it can as a rule do no harm. In its dried state, however, the sputum of patients suffering from tuberculosis and which is expectorated during

coughing, floats about the air, and being taken into the lungs of a susceptible person, finds lodgment and develops, giving rise to the disease.

If in any way the sputum becomes dried, on floors or walls or bedding or carpet or handkerchiefs or towels or on the person of the patient, it may soon become disseminated in the air as dust, and can then be breathed into the lungs of exposed persons. Sometimes millions of the bacilli are coughed up and spit out in a single day by a consumptive patient, in fact it has been estimated that in some cases two or three thousand millions of tubercle bacilli are discharged in the expectoration from a single case of tuberculosis in the course of twenty-four hours.

The germs may remain for months in the dust and *débris* of damp, filthy, and overcrowded homes, retaining their vitality, and they often take on more virulent infective properties than they possessed when expelled from diseased lungs. In a room occupied by a tuberculous patient the dust was shown to contain virulent bacilli six weeks after her death. In 118 dust samples from hospital wards or the



rooms of tuberculosis patients, where great care had been taken to keep them free from germs, forty were found to contain the tubercle bacilli.

Thousands of consumptives expectorate on the street and sidewalk, and ladies thoughtlessly trail along behind them their long skirts, sweeping a numerous assortment of disease germs, which are taken into the home, and, when the skirt is brushed are spread about the house as dust on books and furniture and breathed into the lungs of every one about. Tuberculosis is often contracted in this way.

It has been clinically demonstrated that at least sixty per cent. of all cases of tuberculosis can be traced to prolonged intimate contact with tuberculous relations or occupation of houses which previously had been occupied by consumptives. At least twenty-five per cent. can be traced to prolonged intimate association with consumptives in occupation and prolonged intimate social relations with them, such as take place when a consumptive pays long social visits to a friend. The remaining fifteen per cent. can be traced to contact with tubercular sputum

which is ejected in saloons, churches, public places, schools, street cars, railway cars, streets, etc.

Tubercle bacilli may be distributed by direct contact as in the act of kissing or by means of an infected glass, spoon, or other articles, or it may be conveyed by means of the hands from the handkerchief used by tuberculous patients. Infection may occur by young children who play about the floor in a room occupied by a consumptive, and then suck their soiled fingers. Tubercle bacilli has been found in the dust of pillows, railing, and ceiling of a berth in a railroad car. Extensive experiments have shown that the common house-fly may become the propagator of tuberculosis by acting as a carrier of tuberculous dust or sputum. Cases are on record in which tuberculosis has been introduced through decaying teeth. Any place upon the surface which is abraded or from which the mucous membrane or the skin has been removed, may be a door for the entrance of tubercular germs. The interval of time, however, between the infection and the development of the disease is so long that the cause is forgotten

when the effect appears. With the other contagious diseases the effect follows so closely upon the cause that the connection between them is evident.

Bovine tuberculosis can be transmitted to man either through wounds or through the stomach, by the use of milk taken from diseased cattle. In Massachusetts fifty per cent. of cattle were found to be tuberculous, and even a larger per cent. was found in other States. While cattle are the most susceptible to tuberculosis, chickens, guinea-pigs, rabbits, swine, and goats almost as readily fall victims to this disease. Dogs, cats, sheep and horses are not exempt, but less susceptible, perhaps because of the large amount of out-of-door life and active exercise which they enjoy. This shows that in the domesticated animals we have a great breeding ground and reservoir for the bacilli of tuberculosis, and which at this time is practically beyond the reach of the physician and health officer.

It is an unsettled question as to what confers immunity from disease. The micrococcus or germ of pneumonia is habitually present in the

salivary secretions of many healthy individuals, and it is evident that an attack of pneumonia does not depend upon the possessing of the germ alone. We know that typhoid fever, cholera, and relapsing fever are diseases of man, and the lower animals do not suffer from them when they are prevailing as an epidemic. Anthrax may be communicated by inoculation to man, to cattle, to sheep, to guinea pigs, rabbits and mice, but the rat, the dog, and birds never take the disease. Glanders may be communicated to man, to the guinea pig, and to field mice, while house mice, rabbits, cattle and swine are immune. The negro race is less susceptible to yellow fever than the white race; on the other hand, smallpox is exceptionally fatal among negroes. Thus, if a hundred persons are equally exposed to the tubercle bacilli, many will not contract the disease. The resistance to tubercular infection, which is shown by many persons, is not peculiar to tuberculosis, but exists with relation to all of the infectious diseases. If a number of persons drink typhoid bacilli in water, only a small percentage of them will contract typhoid fever, the others es-

caping. Similar conditions exist with regard to the other infectious diseases.

Experiments on animals go to show that whatever lessens the vitality or lowers the general strength or vigor, whatever depresses the system generally, whether from physical or mental cause, in the same degree lessens the general resistance, and the resistance thus lessened renders man vulnerable or susceptible to whatever he is exposed to. The resistance may be lessened by many things—overwork, fatigue, loss of sleep, disappointment, unsatisfied ambition, grief; in short, by hardship of any sort, whether it affects the body or the mind, by anything which puts a man out of harmony with his environment.

Therefore anything that lowers the bodily health, the vital resistance, makes a soil for the tubercle bacilli, which introduced into a weakened body with little resisting power, finds its proper soil, develops and infects and spreads, until we have from a small focus in the beginning a very largely distributed disease.

Vitiated air, humidity, damp cellars, unsanitary and insufficiently ventilated dwellings and

workshops, deprivation of daylight and sunlight, insufficient and improperly cooked food, mal-nutrition, and indigestion; general ignorance of personal hygiene; exposures, want, grief; the abuse of alcohol, etc., all tend to prepare the system for the germination of the tubercle bacilli, although they cannot produce tuberculosis without the tubercle bacilli. Previous attacks of certain diseases such as la grippe, pneumonia, pleurisy, bronchitis, diabetes, cirrhosis of the liver, by lowering the vital resistance, make the person more susceptible to tuberculosis. Certain employments like coal-mining, glass working, stone cutting, street sweeping, mattress making, etc., predispose to lung trouble.

It is a very prevalent opinion that bad colds beget, generate, originate tuberculosis, but a bad cold can no more originate tuberculosis than powder could ignite without fire. So the fear of taking cold, in the belief that such a cold aggravates tuberculosis, effectually cuts off the invalid from the most important of all means of cure. People are apt to take more and more care of themselves—in other words to

coddle themselves more and more. This treatment tends to make them more and more delicate; less and less able to withstand exposure; more and more sensitive to the depressing effects of cold; less and less capable of reacting healthily against it, and, what is far worse, more and more afraid of fresh air and good ventilation.

## CHAPTER III.

### HEREDITY.

BEFORE the discovery of the tubercle bacilli, heredity was supposed to be of great importance as a factor of the disease; but in the light of modern scientific inquiry infection has supplanted direct heredity as the factor in the production of the disease. Direct transmission of tuberculosis is claimed to be exceedingly rare. Professor Osler, of Johns Hopkins University, maintains that there are only twenty cases on record of persons who have been born with the disease. In one hundred and seventy-six cases of tuberculosis the disease was found to be in the parents or grandparents of only forty-two. It is important that this should be thoroughly understood, because it contradicts a long-prevalent tradition regarding the heredity of tuberculosis.

Although tuberculosis itself is very seldom



hereditary, there is a certain type of structure which has marked hereditary characteristics on account of which feeble resistance is offered to the invasion of the tubercle bacilli. Only a predisposition to tuberculosis may be inherited; this consists not only in the configuration of the chest, but also in the degree of the functional activity of the organs, and in such a conformation of the body as makes it a suitable soil for the bacilli. There is a certain type of structure which has marked hereditary characteristics on account of which feeble resistance is offered to the invasion of the tubercle bacilli.

There is inherited very often from a tuberculous mother, much more rarely from a tuberculous father, a physiological poverty, which may handicap the offspring in its development, and offers, when occasion presents itself, a suitable soil for the invasion of the tubercle bacilli. This hereditary predisposition is a condition which can be overcome by judicious training, proper food, and out-door exercises, and the avoidance of all excesses. We often have seen children of a consumptive parent grow up to be strong men and women.

Experience teaches us that vulnerability or predisposition to tuberculosis runs in families. The same is true of measles, scarlet fever, and other infectious diseases. This individual or family susceptibility may be either inherited or acquired, and it is not always easy to distinguish between the influence exerted by heredity and that exerted by bad food, exposure to cold, foul air, and other conditions which lower vitality and render the individual a ready prey when infected.

We must understand, therefore, that certain individuals are more likely than others to acquire tuberculosis, and in fact are more susceptible to the presence of this and other disease-producing germs. A predisposition to tuberculosis is left by several other diseases, apparently because the constitution of the lymph and of the blood after these illnesses favors the implantation of the tubercle bacilli. Those suffering from diabetes are especially prone to develop tuberculosis; the growth of the bacilli in the human body seems to be favored by an excessive amount of sugar in the blood. This susceptibility to the action of the tubercle bacilli

as well as other disease-producing germs is hereditary. Therefore it is not the disease, tuberculosis, which comes into the world with certain individuals or with successive children of the same family, but the aptitude to contract it should external conditions favor.

The conclusions of the recent congress of experts at Berlin are as follows:

1. Tuberculosis is a communicable disease, due to Koch's tubercle bacillus acting on an organism prepared to receive it or unable to resist the bacilli when present in large numbers.

2. Tuberculosis is not to any great extent hereditary.

3. Tuberculosis may be prevented by removing the source of infection, by improving the environment, and by strengthening the individual.

4. Tuberculosis in many of its severe varieties can be cured.

These propositions may be accepted as scientific truths, and with absolute certainty.

With regard to marriage, many authorities consider that consumptives should not marry, for as a general rule married life is prejudicial

to recovery from tuberculosis. The question whether tuberculosis patients ought to marry is considered by Dr. Richard Rosen without any regard to the offspring of the marriage. He confines himself to the inquiry whether a tuberculous person should marry a healthy one. He holds that if the disease has existed for a long time and is progressing marriage should be absolutely prohibited. In the initial stage of pulmonary tuberculosis, on the other hand, he thinks that no general rule can be laid down. A patient who has had no pulmonary signs of the disease for two years, and is in a good state of nutrition, may be allowed to marry, but a physician should be more scrupulous about granting consent to marriage to a tuberculous woman than to a tuberculous man, because experience has shown that pregnancy and parturition often cause very rapid aggravation of the disease. There is no doubt that infection through marriage is possible.

## CHAPTER IV.

### SYMPTOMS AND DIAGNOSIS OF CONSUMPTION.

TUBERCULOSIS is often remarkably insidious in its development. The early symptoms are principally manifested by impaired nutrition, accompanied by loss of weight, feeble digestion, impaired muscular strength, a pallid aspect, and palpitation of the heart; but these symptoms are rarely sufficiently marked to excite the attention of the patient or others. The cough, fever, and night sweats, while present, do not cause serious inconvenience until later, when we also have the lesions due to the secondary involvement of the larynx and intestines. In females, suppression of the menses is a symptom significant of the progress of the disease. The menstrual discharge diminishes in quantity, and generally becomes suppressed. The progressive loss of weight, coming on without

any apparent cause, such as loss of appetite or deranged nutrition, is one of the most constant symptoms of the pretubercular stage, in many cases preceding it for weeks or months, the slight cough with no expectoration, which marks the actual beginning of a pulmonary change, suspected but not often recognized. Difficult breathing on exertion and rapid heart-action are symptoms occurring very early.

Pulmonary hemorrhages are sometimes of early occurrence. Neuralgic pains, which are common in advanced cases, may also be felt very early in the disease. Chilly sensations and abnormal sensitiveness to cold may be early noticed. A careful observation of the temperature will usually show a continued daily elevation of a fraction of a degree or a degree in the afternoon. The various symptoms all indicate one thing, and that one thing is at the bottom of every case of tuberculosis—a *want of vitality*; that is, a want of general vigor of system, of constitution. These indications of diminished general health, and a deteriorated constitutional vigor, generally occur before any one can positively state that tubercle exists in the

lungs. Colds that “hang on” in spite of ordinary treatment, and that show a certain absence of reactive vitality in the system, should awaken suspicion.

It is a remarkable fact that there are often a marked absence of chest sounds in many cases of advanced tuberculosis; so that the examination of the patient by listening for abnormal sounds or by percussion amount to nothing—or worse than nothing—for the patient is steadily growing worse. There is a striking uniformity of opinion among experts in diagnosis that the physical signs in the lungs must not be depended on absolutely for the ultimate decision as to the presence of incipient tuberculosis. However, in the second stage of the disease, the practiced physician by means of the sounds and resonance of the chest has no difficulty in diagnosing the disease.

The tuberculin test, which is so valuable in veterinary science in establishing the presence of bovine tuberculosis, should not be employed in man on account of the occasional severity of the reaction and the possible danger of aggravating the disease. There is a practical agree-

ment that its use is unjustifiable. In well-marked pulmonary tuberculosis it sometimes fails to give any reaction. The X-rays can give no material aid in the early diagnosis of incipient disease.

The early diagnosis of pulmonary tuberculosis is a question of supreme importance, indeed, it is the most important which the physician has to face; for upon a correct diagnosis depends the patient's life. *If a correct diagnosis is made in the early stages of the disease, we can almost certainly bring about complete arrest of the disease.* The chief difficulty encountered in the management of patients affected with pulmonary tuberculosis is due to the fact, that only too often the disease is not recognized in its incipency. Yet if certain rules of diagnosis are carefully and considerably applied, there is but a very small percentage of cases that need escape detection in the early stages. The gross superficiality with which, as a general thing, the diagnosis is made in lung disease, even by so-called specialists, is most astonishing. From the fact that the help which can be given in each and every case of



lung disease rests *entirely* and *only* upon a correct and complete diagnosis, renders it absolutely necessary that a correct diagnosis be made in every case. The average duration of a case of tuberculosis is from two and one-half to three years. The majority of cases are not recognized until some of the symptoms have existed for a year, and this year is the one in which the most good can be done by prompt and efficient treatment.

If a patient is told by a careless doctor that his lungs are merely "weak" or that he has an affection of the throat alone, or a slight bronchial trouble, a fatal blunder is often made, and nearly always makes final recovery much more difficult. Not a few cases run a gradually declining course to a fatal termination which might have been avoided if only the patients had understood in the earlier stages the reasons for close attention to treatment.

It should be remembered that a positive diagnosis can be made whenever tubercle bacilli are present in the expectoration, no matter what physical signs may or may not be found. Therefore microscopical examination of the

sputum should not be omitted in any suspected case. Myriads of cases are yearly overlooked in the early stages of tuberculosis, because of the dearth of physical signs, which could be easily marked as tuberculosis if the trouble had been taken to make a microscopical examination of the sputum. It is a lamentable fact that anything approaching a routine sputum examination by the general practitioner is not practised. Not one physician in a thousand has a suitable microscope or understands the use of them. It simplifies methods of examination. The introduction into general use of oil-immersion lenses have made the detection of tubercle bacilli a matter easily performed by the intelligent physician. An outlay of one hundred dollars will provide a suitable microscope, with all of the accessories, and will place in the hands of the physician the means of making a positive diagnosis of tuberculosis, and of saving many lives.

As Professor M. Howard Fussell says: "A detection of the tubercle bacilli in the early stages—only a month or a year earlier than a diagnosis would otherwise be made—would be

of incalculable value to the human race. This fact alone, it seems to me, must appeal to every practising physician. It is the family doctor who first sees the case. If he would make, or would have made an examination of the sputum in every case of continued expectoration, and have the sputum of tubercle bacilli destroyed, in a few years the cases of tuberculosis in the world would be greatly lessened. Instead of taking this trouble the patient is told all sorts of tales, until continued failing health, a progress of the physical signs, so that he who runs may read, at last suggests a sputum examination, when the organisms are found. Can anyone calculate the new cases which will originate from such a neglected case, or the value in saving human life, by the expenditure of a few minutes of the doctor's busy life? "

Necessarily a working knowledge of a microscope and the ability to recognize various organisms, when seen under the microscope, are indispensable. However, no one is too old to learn.

Tuberculosis in its earlier stages is as curable as any other serious disease with which

medical men have to deal. There is no reason, abstractly considered, why any person, not advanced beyond the second stage, should die of tuberculosis, because there is no necessity for a person dying of any disease that may fairly and justly be considered curable, and amenable to the effect of medicine and hygienic surroundings. There is nothing essentially destructive or necessarily fatal in tuberculosis, and in all stages of the disease it may be checked, and the patient afflicted may live many years subsequently, and die of old age or other disorders. But the arrest and cure of the disease rests primarily with the patient, and on his loyal co-operation with his physician, provided his physician does not place his reliance upon drugs alone, and is familiar with the modern twentieth century methods of curing the disease. It is only by the most careful observance of all the details of treatment that the patient can expect to be restored to health.

The expectation of improvement, prolonged life, or even recovery, with some patients amount, in some cases, to an insane delusion. As a writer has said: "The patient is hopeful

respecting his condition; he depreciates the symptoms, and is reluctant to admit that his malady is serious. This state of mind sometimes amounts to an infatuation, which renders it difficult to obtain from the patient a fair account of his symptoms, and it is necessary for the physician to rely chiefly on the statements of others and his own observation.

## CHAPTER V.

### THE TREATMENT OF CONSUMPTION WITH DRUGS.

THERE is no disease in the long list that human nature is subject to, the treatment of which has occupied the minds of physicians so constantly and for so long a period as that of pulmonary tuberculosis. Time after time the discoveries of remedies have been announced. But the innumerable remedies that have been arrayed before the public and had fair and persistent trials, have failed to establish the virtues claimed for them, although some of them properly used are exceedingly useful in palliating some of the distressing symptoms of the hopeless cases.

Professor Austin Flint, one of the great physicians of his day, in his work on the *Principles and Practice of Medicine*, says: "Unhappily, the treatment of acute pulmonary tuberculosis

may be dismissed in a very few words. The condition of the patient is hopeless, and all that the physician can do is to palliate symptoms, and support the powers of life." Dr. Nathaniel Chapman of Philadelphia denounced a man who professed to cure tuberculosis, as sinking himself to the most degrading charlatanism, and solemnly declared that, in a practice of fifty years, he had never seen a case of decided tuberculosis cured. Dr. John Swett, who wrote a bulky *Treatise upon Diseases of the Chest*, says: "I willingly admit that no remedy has as yet been discovered which appears to exert any specific influence upon tubercle, either in preventing their development or in promoting their cure.

There is, perhaps, no disease in which the public are so ready to catch at any course of treatment which promises relief, as the one under consideration. Unscrupulous quacks and charlatans are constantly advertising in the public press, particularly the religious newspapers, "Absolutely all consumption cured." These are arrant frauds, and many poor consumptives have been deceived by their state-

ments and have parted with their hard-earned money for medicines which are absolutely of no value in the treatment of the disease. Respectable newspapers, particularly the religious press, should be ashamed to advertise the extravagant claims made by these quacks, as they serve chiefly to enrich the promoters at the expense of the poor and frequently ignorant or credulous consumptive.

If everyone thoroughly understood that there exists no specific medicine for the treatment of pulmonary tuberculosis, and that no cure can be expected from any kind of medicine or method except the regularly accepted treatment which relies mainly upon pure air and nourishing food, then these lying advertisements would cease to appear. As the writer has said in another publication, any person who manufactures a secret remedy for the removal of disease in its various forms, without knowing the climate in which a person may live, his color, habits, age, sex, temperament, peculiarities, heredity, etc., is a dangerous quack, and his deceptions show him to be an impostor, and his patent nostrums are degrading alike to hu-



manity and the profession of medicine. The patent medicine business is founded upon human credulity. It is cruelty to speculate upon the necessities of the sick; to pillage those who have the strongest claim to our sympathy by abusing their confidence; and still more, it is to trifle with health and life by inducing the afflicted to postpone the use of rational means of cure, until their diseases become more formidable, perhaps intractable. Upon all subjects of a medical nature it is remarkable how easily even educated and intelligent persons are tricked, misled, cheated, plundered and deceived by the most shallow frauds and palpable impostures. If the public was not so easily gulled, these quacks, charlatans, and scoundrels would very soon disappear. Their proper place is in the penitentiary.

In the last hundred years there have been announced by reputable physicians scores of cures for tuberculosis, some of them based on scientific work, and others from clinical experience. But up to to-day there is not a single drug named or described in any standard work that in itself has inspired confidence of the

profession sufficiently to assure its general adoption in the treatment of tuberculosis, with the hope thereby to effect a cure. Of course, drugs have their uses in meeting annoying complications as they arise. For instance the harassing cough which so disturbs sleep and the exhaustive diarrhœa must be held in check. But at the best, these remedies are only palliative and transient in their action, and have no effect whatever upon the tubercular process in its origin or the local deposit, and should never be used except for the purpose of alleviating symptoms and regulating functions.

If we examine the treatment of tuberculosis used during the last one hundred years, it is easy to see that the means recommended are not only valueless, as is admitted, but that they absolutely hurry their victims to their long and silent rest. We often see the patient making a drug shop of his stomach, using lozenges, drops and mixtures, to relieve cough; opiates and sedatives, to cause sleep and diminish irritability; gallic acid, tannin, and acetate of lead to check diarrhœa or arrest hemorrhage; sulphuric acid and atropia to relieve sweating; chalk, bis-

muth, and antacids, to combat acidity and dyspepsia; quinine, iron, or bitters, as tonics; alcohol to support strength; cod-liver oil, malt, etc., so that the stomach, drenched with drugs, is utterly prevented from performing its healthy functions. The success or failure of all therapeutic measures depend upon the condition of the patient's stomach and the recognition of the defective assimilation and digestion, and the estimation of the powers of digestion and assimilation of tuberculous patients is one of the most complex and difficult problems of practical medicine. No drug, whatever its virtues, which upsets the stomach, destroys the appetite, or creates a disgust, can, or ever did, do good.

It is impossible here to enumerate the various drugs that have been used in the treatment of tuberculosis. We will mention only the more prominent ones which have been used of late years. The great Edinburgh professor thundered forth the therapeutic key-note, and the medical world echoed "cod-liver oil," and thenceforth continued to lubricate their unfortunate patients, because Professor Bennett had said cod-liver oil is good for consumption.

Cod-liver oil has not any specific influence on the disease. It is not a remedial agent in any sense of the word. It may build up temporarily, but it does not cure. It often intensifies the digestive disturbance and adds a heavy burden to the already weak, physically incapacitated stomach and intestines. Very little pure cod-liver oil is to be found in the market. When it can be obtained it is good nourishment, and nothing more, and it is very probable that other kinds of oil, equally well prepared, may exert the same beneficial influence. So-called cod-liver oil emulsions are useless. In all the percentage of oil is so small, compared to the material added to make the emulsion, that large quantities of the emulsion must be injected and the stomach is thereby overtaxed, being already weakened by the very disease for which the oil is given.

The hypophosphites have for a long time been prescribed for the alleviation of tuberculosis and allied diseases characterized by tissue waste, and perhaps in some cases they may act in a beneficial manner, increasing the appetite, stimulating digestion, and favoring nutrition.

But they are not in any sense of the word a specific, and their continued use is surely apt to be followed by an exhaustion from which all means fail to rally, although the immediate results are apparently beneficial.

Creosote is perhaps recommended by more authorities at the present day than any other drug. Beachwood creosote, creosote carbonate, and especially its derivative, guaiacol carbonate and creosotal, and potassium guaiacol sulphate—known as thioal, have been largely, and indiscriminately prescribed to lessen the cough and the amount of expectoration, to reduce the fever, and to act as an intestinal antiseptic. Whether the remedy does good or harm, depends mainly upon the condition of the stomach, and, it not being customary, as it ought to be, always to ascertain the condition of the stomach, creosote is very liable to derange the digestion, especially as many of the commercial preparations contain gross impurities, especially carbolic acid, and are unfit for internal use. In small doses creosote is inactive and in large doses it is apt to be a corrosive poison, which coagulates albumen and produces disastrous effects.

Intestinal digestion is almost sure to follow, owing to the bad effects upon the pancreatic gland. The improvement in nutrition following its use is very illusory in calling up the phantom of hope for continued improvement in the physical condition.

Cinnamic acid and sodium cinnamate, introduced by Prof. Albert Landerer, of Stuttgart, Germany, have been highly recommended by some physicians, and by others it has been found to be harmful in acute and subacute forms of the disease. Prof. Mann, of Denver, Colorado, after an extensive use of this drug, thinks that it will quicken to a marked extent the healing processes when they are sluggish and altogether inactive, though not in all cases.

Cacodylic acid derived from cacodyl, and its sodium salt, has been introduced recently as a therapeutic agent. In advanced cases the action of the drug is by no means specific, but in the earlier stages, the drug has a tendency to diminish tissue waste produced by nervous overstimulation.

For a while the serum treatment had many advocates, and, indeed, does at the present day.

Various serums have been and are being placed before the physician and patient by people who have undertaken to make their fortunes by imposing upon the credulity, both of the profession and of the laity. There are many cases where the microscope has revealed the tubercle bacilli, when there was no fever, night sweats, or sputa, and having been treated with serum, the general health at first seemed to improve, and the bacilli decreased or entirely disappeared; but with the disappearance of the bacilli of tuberculosis, hectic fever set in and one patient died in eight days and another in ten with the symptoms of septic poisoning. Such a result recalls to mind the phrase sometimes employed after brilliant surgical operations in describing the result; "But the patient died cured." The fact of the matter is that, in diseased conditions the so-called germs are, under whatever name we give them, Nature's scavengers of waste and effete matter, the means employed by the animal organism to eliminate the products of disease. Extended experiments have shown that the various serums do not possess either a germicidal or a curative effect.

The evidence of the most experienced physicians are decidedly against them. If employed at all, it should be only by the specially skilled, and under circumstances in which the patient can be carefully watched and guarded.

With much enthusiasm, and with high hopes of its future usefulness, Koch's tuberculin was received in the autumn of 1890. Before the end of the following spring the remedy had to a great extent fallen into disuse, and was damned as loudly as it had ever been welcomed.

Koch's tuberculin is an extract of the products of pure cultures of the tubercle bacilli, made with glycerine and water. Koch held that the remedy would not promptly kill the bacilli, but that it produced a specific action upon the living tuberculous tissue, carrying its disintegration. He also stated that it would increase the power of the body tissues, and thereby make the soil infertile for the development of the organism. It was soon pointed out, however, by Virchow and others, that following injections of tuberculin there occurred a softening and disintegration of the quiescent



deposits, and this led to the dissemination of the bacilli through the body.

Koch's tuberculin in his hands no doubt did effect some cures. But the remedy fell into discredit.

1. By its frequent use in unsuitable cases by incompetent physicians.

2. By its administration in too large doses.

3. By neglect of the rule that a dose of it should never be given until the patient's temperature had been normal for the previous twenty-four hours at least.

4. By neglect of the rule that the dose of tuberculin should never be increased, but on the contrary, should be diminished, when its administration had been followed by a rise of temperature.

5. By the prejudice raised against the remedy, among both doctors and patients, because of the severity of the symptoms, which not seldom follow upon its use.

Dr. Bergeon, of France, a few years ago introduced an experiment which consisted of injecting into the rectum carbonic acid gas charged with sulphurated hydrogen. The prin-

ciple upon which the treatment is based is that the disastrous results of pulmonary tuberculosis are due to a blood-poisoning set up by absorption of the noxious products of suppuration in ulcerous lesions in contact with atmospheric air, and that repeated and prolonged bathings of the suppurating surfaces with a safe antiseptic agent, controls the suppuration and gives the lesions an opportunity to undergo cicatrization. The method, however, soon proved a theoretical delusion and an utter failure.

Oxygen is largely advertised by quacks as a sure cure for tuberculosis. It is valueless as a remedy and often hastens death. It is not easy to understand, in view of what is known of the real causes of the lung trouble, how any very radical results can be obtained from mere local applications by means of inhalations, to the diseased parts. Certain it is that such means of combating the disease have been tried over and over again without marked effect. Inhalations, however, judiciously used, assist in allaying symptoms and in many cases appear to influence the disease favorably. In the hands of

the writer the inhalation of formalin has been found to be an excellent preliminary to the open-air treatment. Eucalyptus, benzoin, thymol, menthol, iodine, creosote and formaldehyde, no doubt will be found useful by inhalation and as an adjuvant. Formic aldehyde is at the present day the most powerful antiseptic for tubercle bacilli, and it is non-poisonous and non-corrosive. But inhalations should always be used in conjunction with open-air methods. Experience has shown that the inhalation of formalin, in connection with the modern treatment by air, food, and exercise soothes the laryngeal and bronchial mucous membrane; renders the expectoration less tenacious, and in time diminishes it; lessens the fever; diminishes the number of tubercle bacilli, and in some cases entirely eradicates them.

Another remedy that has proved of good service, especially in patients who have been unable or unwilling to follow the hygienic treatment, is the Compound Tincture of Benzoin. It was used in former generations more than any other remedy. It is by no means a specific, but it seems to have a beneficial effect upon the

general nutrition, and to allay irritative forms of cough. It has been prescribed extensively at the Brompton Hospital for Consumptives, and with good results. It may prove a good adjuvant with the out-door treatment.

Nothing brings the patient more quickly and surely to the grave than alcohol. Alcohol has never cured and never will cure tuberculosis. It not only poisons the system, but it ruins the stomach and thus prevents this organ from properly digesting the necessary food. It impairs nutrition, the very function which, of all others, it is important in consumptives to maintain in its highest integrity. The elimination of alcohol by the lungs increasing the congestion of the bronchial mucous membranes, and thus enhancing the cough, is very objectionable. The digestion is impaired as well as the heart's action through fatty degeneration, and other functional and pathologic conditions are produced or intensified. One of the most important offices of breathing is to remove from the blood the carbonic acid gas, while drinking alcohol retains it. The more a man drinks, the less carbonic acid gas is carried out

of the system by the expired air ; it must, therefore, be retarded, and must accumulate, rendering the blood more and more impure.

We wish once more to impress upon the mind of both physician and patient, that there is no disease perhaps in which we should be more careful to give drugs than in tuberculosis, and they should be used only to relieve some urgent symptoms. The system is already in a lowered degree of vitality, and every effort should be used to assist nature to throw off the disease. No disease varies so much in its manifestations in different people, therefore, it is impossible to lay down any hard-and-fast rules regarding the treatment of each individual case. It must be remembered that as the basis and foundation of a rational treatment of pulmonary tuberculosis must lie an intelligent and persistent application of hygienic, dietetic, and, if possible, climatic measures. It is only by constant medical supervision that one can take advantage of the variations in the patient's condition or prevent harm, as each tuberculous patient must be dealt with on his merits. "What is one man's meat is another man's poison."

Unfortunately the majority of tuberculous patients expect to be cured by medicine, and not by a series of instructions tending to bring them into obedience with the laws of nature.

## CHAPTER VI.

### HOW CONSUMPTION CAN BE CURED.

THE consensus of opinion among writers of great experience and ability is that our hope to effect good results in the management of tuberculosis, in the great majority of instances, rests upon the institution of correct treatment in the incipency of the disease. If this is done, the hope of securing good results is reasonably good in the great majority of cases. It is absolutely necessary that there should be an early recognition of the disease, and the intelligent co-operation of the patient with the physician in carrying out for a sufficient period of time the simple hygienic and therapeutic measures which are everywhere obtainable. Ultimate recovery will depend largely upon the faithful compliance of the patient with the hygienic instructions given and the continuance of the

treatment for a sufficient time. It has been well said that the consumptive must make a business of getting well.

It is very important, therefore, to make patients understand that very much depends on their own exertions. One of the great difficulties in the way of successful management is a passive, patient, tranquil frame of mind, which cannot be aroused to any vigorous efforts. Persons endowed with resolution, energy, and perseverance, other things being equal, are more likely to struggle successfully with the disease than those who are deficient in their mental qualities. The patient has to be taught how to use his lungs, widen a narrow chest, stimulate the sluggish skin, and regulate thereby the unbalanced circulation, bring into play all those natural recuperative forces which he has neglected, or perhaps never known; then will the appetite and spirits begin to return; then will the color of health replace the hectic flush in the cheeks; then will the lesions of the lungs clear up, and cicatrize or calcify, and he will live perhaps many years.

To conduct a case of tuberculosis to a suc-



cessful issue requires infinite attention to details, constant vigilance, and a command of every resource, hygienic, dietetic, hydropathic, and medicinal—the latter of the least importance, for, as we shall see, of the remedies useful in the management of tuberculosis, drugs occupy but a very small space. The chief reliance is to be placed upon the scientific use of air, sunlight, water, food, rest, exercise, etc.—that will improve nutrition and increase vital resistance. The whole object of treatment is to fortify the patient's constitution against the inroads of the disease so that the individual cells of the body have the stamina to fight against and destroy the tubercle bacilli.

Having no specific means by which we are enabled to destroy the tubercle bacilli, we are compelled to depend upon the inherent powers of the body for the accomplishment of this purpose, or the modification of their deleterious influences. It is, therefore, as we have said, to so increase the resistance of the patient as to bring about the arrest of the tuberculosis process, prevent dreaded secondary infection and induce final cure. All efforts in other

directions waste time and hinder opportunities. So long as the bodily soil is favorable for the propagation of the microbes they will multiply in spite of all local treatment.

Experience of late years has abundantly shown that the healthy body can overcome the germs of tuberculosis and slay them by its own physiological action. In fact, the most successful modes of treatment in the past have been those that aimed to improve in every way the general health of the system, those that relied upon the natural tendency of the body to resist and expel infection, and that in any way, directly or indirectly, increased its defensive powers. Among these are, first and foremost, the out-door, dietetic, hygienic, and climatic methods, and the treatment in sanatoria. These methods we will now proceed to consider.

## CHAPTER VII.

### OPEN-AIR TREATMENT FOR CONSUMPTION.

WITHOUT a full and free exposure to outdoor air, regardless of all weathers, no case of tuberculosis ever has been cured; while with it, *and it alone*, many cases have been and may be cured. An open-air life not only preserves and strengthens the resistance of the body to the inroads of the bacillus, but it destroys the tubercle bacillus itself. No remedy known to man has such a powerful and permanent influence in maintaining or regaining health, as the judicious employment of cheerful exercise in the open air.

A large amount of oxygen is required, both day and night, to preserve vitality. It is now conceded by many physiologists, that the amount of oxygen inhaled during sleep exceeds the quantity breathed in during the

waking hours. Each night the system stores up oxygen as fuel, to sustain the vital powers during the activity of the succeeding day. All patients, at whatever stage of the disease, should have a plentiful supply of fresh air constantly passing through the room during sleep —themselves protected from the draft.

We breathe for the purpose of obtaining oxygen, which constitutes about one-fifth of the atmosphere. The remaining four-fifths consists of nitrogen, a comparatively inert substance, intended chiefly to dilute the oxygen, so as to adapt it to the body. If we breathe from sixteen to twenty times a minute, we consume from twenty to twenty-five cubic inches, or one-third of a pint, of oxygen each minute, or two-thirds of a cubic foot every hour, amounting to sixteen cubic feet, or four barrels every twenty-four hours. No matter how pure the air is brought to the lungs, when this volume returns, it is saturated with impurities of the most deadly character. With each respiration we spoil for breathing from two-thirds to three-fourths of a barrel of air.

The oxygen received into the lungs is absorbed by the dark, purple, almost blackish, venous blood. This blood has served for nutrition, and would cause death in a very short time. It has traveled through the body and by the veins brought to the heart where it is sent to the lungs. The oxygen transforms it into bright, scarlet blood (arterial blood), and starts it again on its mission of repairing waste and of tissue building. The breathing of pure air for so short a time as two and one-half minutes imparts purification to the whole human frame. The food we eat never becomes blood until it meets, in the lungs, the air we breathe; if, then, we do not take in enough air, or what we do take in is impure, the blood will be imperfect and in proportion unfit to nourish, strengthen and vivify the body.

Bad air is the cause of more maladies than almost any factor in our daily lives. When the indrawn breath does not contain a sufficient amount of oxygen to burn up and remove the impurities from the blood, these accumulate with the days and years, and vitiate, first the lung tissue, and by degrees every particle of

the physical frame. Impure air produces a partial stagnation of all physical functions, and no amount of medicine will ever take the place of the normal quota of clean, fresh air.

Close rooms and inadequate ventilation bring tuberculosis to countless thousands. Close bedrooms make the graves of multitudes. Every bedroom should be well ventilated, both night and day, and capable of being easily flushed with a continuous supply of fresh air, and during the day freely open to the sunshine. The position of the bed should be such that no direct draughts play on it, but that free circulation of the air in its neighborhood is obtained.

If patients are well nourished, sufficiently clothed and sheltered from the wind, any degree of cold may be defied. In sanatoriums patients lie out of doors from five to ten hours in thick fogs and snow-storms, and when the temperature is below zero, without any bad effect. It has been found that delicate patients rapidly become acclimated to exposure, and have a good circulation, while the appetite is improved, and various forms of distressing cough are relieved. There is no danger from

*constant* exposure, and the most delicate patient soon becomes habituated to an open-air life and to every and any degree of inclemency.

In sanatoriums for the treatment of tuberculosis the heating arrangements are such that the temperature is never raised more than a few degrees above the outside temperature, so that no sudden variations may be experienced when the patient leaves his room. It is the sudden alterations of temperature and exposure to drafts that leads to colds. During the greater part of the year a tuberculous patient does better in a tent or a simple wooden shelter on the grounds away from the house, the floor being raised two or three feet from the ground. Here he should have his meals and rest. It has been found by experience that no amount of exposure to wet, or any variation of temperature, causes the most delicate patient to contract what is termed a chill, or to suffer any other harm so long as an open-air life is led and the exposure is constant. It is a groundless fear of the weather which sends multitudes of consumptives to an early grave.

A bedroom should be effectively shut off

from the kitchen, water-closet, and anything likely to contaminate the atmosphere. It should be so arranged that no accumulation of dust can occur. There should not be less than one thousand feet of breathing space, and, to prevent any unnecessary contamination of the air, no second person should sleep in the same room, and no light should be burned during the night. Two persons in one bed are out of the question under any circumstances.



## CHAPTER VIII.

### HOW TO BREATHE PROPERLY.

THE art of breathing correctly is less understood than any one of the various functions of life. It is natural to breathe, of course, but very few persons perform the function of respiration naturally. Many persons do not know how the diaphragm works during the act of respiration. In correct respiration the diaphragm descends during inhalation, and all the muscles connected with the side ribs expand. When the breath is exhaled the diaphragm ascends. Respiration should be slow and deep, causing large quantities of air to come in contact with the membranes that absorb oxygen from the air inhaled. Many women never take a full breath after adult life is reached, and the average man, who has given up vigorous exercise, rarely fills his lungs to their full capacity.

In fact, many persons are so unaccustomed to forcible breathing that an attempt is followed by exhaustion, dizziness and palpitation of the heart.

Correct breathing performs a double duty. First to purify and revitalize the blood. Life is a process of oxidation. The red blood cells are set apart for the special work of carrying oxygen to the rest of the cells of the body, while the lungs are arrangements in which the red blood cells can obtain oxygen from the air. Second, by means of diaphragmatic breathing each organ is kneaded or massaged and receives its share of benefit. Every full breath means a force exerted by the internal muscular system equal to raising a weight from one hundred and seventy to two hundred pounds. Rich, full blood is forced into every cell. It makes ruby lips and plants roses on the cheeks.

After the fullest possible inspiration, the lungs should contain about 330 cubic inches of air. After the fullest possible expiration, the lungs still contain about 100 cubic inches of air. So it is possible, by strong effort, to inhale and exhale about 230 cubic inches of air. But the

great majority of people rarely inhale more than thirty cubic inches of air in quiet breathing. There are very few people of normal lung capacity. A man may possess a large chest naturally, taking its external dimensions, and yet be able to inhale but a small quantity of air, from long disuse of its full power of expansion, and it may be so confined by a shortening and rigidity of its ligaments, muscles, and other soft tissues, that it cannot be expanded to anything near its full extent. With the great majority of women, by wrong habits of dress they have so crippled their organs of respiration that the most important and vital function of the entire body is rarely, if ever, correctly and freely performed.

Systematic breathing is of the greatest importance, especially in the case of weak lungs or lung insufficiency, and will work wonders in cases of incipient tuberculosis. The flattened chest will be rounded out, giving greater lung capacity, and endowing the individual with an amount of endurance that he never dreamed of possessing.

The patient should be taught how to use his

lungs, widen the narrow chest, stimulate the sluggish skin, and regulate thereby the unbalanced circulation, and thus bring into play all those natural recuperative powers which he has neglected, or never known.

The great men are great breathers. The Napoleons, the Martin Luthers, the Cromwells, the Daniel Websters, the Gladstones, all were deep breasted, full breathing men; so was Bismarck, Wellington, Phillips Brooks, Theodore Parker, Henry Ward Beecher, Spurgeon.

The results of high altitudes in the treatment of tuberculosis have not been due to any creative constituent of the atmosphere or any peculiarity of temperature, but entirely to decreased barometric pressure upon the external surface, compelling a greater expansion of the chest, opening up a larger surface for the interchange of gases and consequently a greater oxygenation of the blood.

The exercises available to produce better respiration are very numerous and varied, but the underlying principle is simply to bring into more vigorous play the muscles which expand the chest and at the same time excite deep and

full breathing, to bring the vital force of the lung to its maximum. The commencement of such exercises is sometimes annoying to those of sensitive lungs, and in such cases they should be commenced with moderation, and increased gradually each time in number of inspirations. Several times a day the inflation of the chest by a series of gentle, deep, prolonged inspirations and forced expirations, when the practice does not provoke coughing, is very important. Whether walking on a level or climbing, the patient should breathe deeply and slowly. In ordinary breathing, the chief movement should be at the waist. The chest should expand at the belt and sides. The expansion of the upper part of the chest is necessary only in very full breathing.

To take a deep, full breath, expand, first the chest, breathing in until the entire waist swells out, the sides expand, and the anterior wall expands; then breathe in a little more until the whole abdomen expands; now try to inhale still a little more by lifting up the chest and drawing in slightly the lower part of the abdominal wall. This gives a full and complete respira-

tion. Paroxysms of coughing produced by full breathing and by distention of unused lung-tissue should not be regarded as a contra-indication.

Deep, full breathing exercises the muscles around the waist, strengthens them and gives one an added power of endurance. Breathing is really a kind of internal gymnastic exercise for the vital organs. The contents of the abdomen are moved and their energy increased; therefore if one breathes only clavicularly, or upper-chest breathing, he does not exercise what is below the lungs, and it is now universally conceded that to enjoy perfect health the breathing must expand the entire trunk.

Breathing is really a mechanical action, performed by the muscles of the chest and the diaphragm, and if the act of respiration is to be perfect the condition of these muscles must be perfect. If one would be strong enough to do arduous work in any line, be it physical or mental, it will depend more on their breathing capacity than the amount of muscle they have acquired.

## CHAPTER IX.

### THE PROPER DIET FOR CONSUMPTIVES.

IN the treatment of tuberculosis, one of the most important points is to insure that sufficient nourishment is taken to make up the past loss, and to maintain the body-weight appreciably above the normal limit. In this way the process of repair is stimulated, the resistance of the individual increased, and the susceptibility or tendency towards relapse lessened. Before a patient can improve, it is absolutely necessary that there be an improvement in nutrition, which must after all come from the stomach. There should be an effort to have the greatest amount of assimilation and the least effort of the stomach to properly digest the food. As a matter of fact, most people who have tuberculosis have some serious disturb-

ance of their digestion and nutrition before the tubercular trouble shows itself. Therefore a clear knowledge is required regarding the dietetic management of the tuberculous patient. A careful study of the chemical composition of the food-stuffs used, their digestibility, the percentage of each absorbed, and the ease with which they are utilized by the system, if necessary. Whenever food can be enjoyed and assimilated there is hope of cure. To realize the superiority of good digestion, with proper food, as a factor in the retaining and regaining of health, we have only to consider that in every case of improvement by change of climate, or a resort to hygienic discipline, the ability to eat and digest an abundance of suitable food was maintained, while the most favorable conditions would prove ineffective if the stomach failed to perform its functions. There is not the slightest question but that tuberculosis is a disease of malnutrition.

Complete digestion consists of four distinct features: 1. The solution and preparation of food, so as to render it capable of absorption. 2. The absorption of food by the blood. 3.



The digestion in the blood, blood metamorphosis, or the changes which support life. 4. The excretion of cinders left by the process, the expulsion of all material which has rendered its service and become unfit for further use. *In the exact proportion as this process goes on, regularly or irregularly, a person is well or unwell. Herein lies the secret of good health.* So exact is the adjustment between want and repair, that a mere trifle, apparently, may disturb the equipoise, and illness is the result. Pure blood calls for good digestion. Just as good fuel and free draft make heat and power for the engine, so suitable food, properly digested, and clear breathing make health for the body.

The indiscriminate stuffing of all tuberculous patients should be replaced by systematic dieting. The diet as regards amounts and constitution should be determined in each case after due consideration has been given to the respective conditions as regards:

1. The activity and extent of the disease.
2. The amount of weight.
3. The digestive capability; and

4. to some extent, personal dietetic likes and dislikes.

In very feeble and already overtaxed stomachs, from eating improper or badly cooked food, the maintenance of normal nutrition is a vexatious and difficult problem. The stomach, already sensitive, must be treated with the utmost consideration. Fortunately, experience has shown that outdoor life and proper breathing impart so much vigor to the patient's physiologic forces that he is enabled to digest and assimilate sufficient food to maintain equilibrium of nutrition, whereby the encroachment of tuberculosis is for the time prevented.

There is great danger sometimes in over-feeding. A consumptive sometimes has a great appetite. Nothing is more common than for consumptives to tell their medical attendant that their appetite is good; or that they eat plentifully, when more careful inquiry proves the consumption of nutritious food is altogether inadequate. Rich foods in excess, fried and salted meats, meat extracts, with malt, cod-liver oil, etc., is already taken into a system already overloaded with material it

cannot use. Oxidation is lessened and undue proportion of waste matter is retained in the system. The diet should be pushed to the limit of digestion, and the further we succeed in pushing it, without allowing the secretory organs to clog or germ-action which causes fermentation, to flourish in the alimentary canal, the more vigorous will be the existence of the patient's vital forces to the onslaught of the enemy. Nature ordinarily regulates the appetite to the needs of the system, and its capabilities. But in tuberculosis, the need for food is greater than the power of digestion, because there is an extra demand for both strength and warmth. As the patient improves and approaches the normal weight, the amount of food must be diminished. It is one thing to fatten a patient and another thing to give him strength and muscle.

What is called nourishment is a mixture of various substances, which, according to their chemical constitution, belong to three groups of food-stuffs, viz., *proteid*, or *albumens*, such as meat, eggs, casein of milk, gluten of bread, and various vegetable proteids; *carbohydrates*,

as sugar and the starches of all cereals; and *fats*, including those of both animal and vegetable origin.

Proteid foods have a particular function to perform, viz., to supply the waste of proteid matter from the active tissues of the body, and this function can be performed only by the proteid foods, hence the latter are essential food-stuffs without which the body cannot long survive. Fat and carbohydrates, on the other hand are mainly of value for the energy they yield on oxidation. They are burned up in the body, when completely utilized, to carbonic acid (a gas) and water. Carbohydrates and fats can never be used for the repair of tissues, only proteids can do that, therefore, without proteids life is impossible.

Lean meat contains twenty per cent. of proteid, some fat, and no carbohydrates, while fat meat contains sixteen per cent. of proteids, about four or five per cent. of fats, and no carbohydrates. On the other hand, potatoes contain two per cent. of proteids and twenty per cent. of carbohydrates. Raw meat extracts are not only bad, but abominable, and should

never, under any circumstances, be eaten by invalids, because they are totally unfit for food, no matter where, or by whom they may be prepared.

The principle of forced nitrogenous feeding, or an excess of proteids, which underlies all dietetic measures, is a sheet-anchor in the treatment of tuberculosis. Nitrogenous feeding is directly opposed to tuberculosis, and, in consequence, milk and eggs form the rational basis of the consumptive's diet.

It has been determined by physiological experiments that the greater the quantity of carbohydrates and fats which is supplied along with the proteids, the less the latter tend to be wasted. The fats and carbohydrates are sacrificed instead of the proteids. An excess of proteids will give rise to a large proportion of waste matter, therefore it is absolutely necessary to keep within the limits of the oxygenating capacity of the system. But with an abundance of fresh air night and day, it is a noticeable fact that the quantities of food which would produce illness in ordinary individuals have a favorable effect on tuberculous persons.

Nature's appetizers, air and exercise, which alone are permanent in their results, and which are as superior to the bitter tonics as sunlight is to darkness.

While tuberculosis patients must be put upon a strict diet, yet a wide latitude can be given to those who perhaps have not come under a physician's care. Soups, such as bouillon, oyster broth, clam broth, mutton broth, beef broth, barley, rice, bean and pea soups and purées, celery broth made with milk and thickened, are useful as a relish.

Beef underdone, roast or broiled; mutton or lamb roast, or broiled chops; sweetbreads, poultry, broiled, roast or stewed; nearly all kinds of game; fresh fish; salt codfish, eggs, boiled, poached, or beat up with milk. All of these may be used, but under no circumstances should any food be fried.

Of vegetables, the green vegetables, lettuce, spinach, asparagus, water-cress, and the like are of great service; as are likewise the legumes, peas, beans, lentils, etc.

Fresh fruit of all kinds are valuable, in the absence of special contra-indications.

Of starch foods, rice, well-cooked, and occasionally sago, tapioca, etc., are the best.

Potatoes, turnips, carrots, beets, and other starchy and sugary roots, and tubers are to be avoided altogether. Tomatoes, onions, and celery may be eaten.

The cereals—hominy, oatmeal, cracked-wheat, and similar preparations are often difficult of digestion.

If bread is eaten at all, it should be toasted. Hot bread, cakes, pies, pastry, sweetmeats, made dishes, rich gravies, crabs, lobsters and, among meats, pork and veal are to be strictly avoided.

Sweet fruits and fruit juices are valuable, not only for their special nutrient properties, but because they act as correctives of the digestive organs, regulating the bowels, cleaning the stomach, and aiding the kidneys in the elimination of the poisons which give rise to fever, night sweats, and other distressing symptoms. The food, of whatever kind, should be thoroughly masticated, and water or other drinks should be used sparingly at meals.

As an aid to the memory we present the following classification:

*Food in which nitrogenous elements predominate:* Milk, meats, eggs, lentils, beans, Scotch peas (dried), peanuts, almonds, and most other nuts, and such nut products as protose and nuttolene.

*Foods in which starch predominates:* Rice, white-flour bread, cake, pastries, farina, corn-starch, potatoes, bananas, fresh peas, fresh corn.

*Foods containing nitrogenous elements, and starch in good proportion:* Wheat, whole-wheat bread, zwieback made from whole-grain breads, granose, granola, corn-meal, oatmeal, corn flakes, barley.

*Foods containing very little nutriment, but which supply bulk, water, sugar, and wholesome acids;* apples, pears, peaches, strawberries, and other fruits, including tomatoes.

*Foods containing but a small amount of nutritious material, consisting largely of cellulose:* Carrots, turnips, beets, parsnips, cabbage, lettuce, spinach, greens, string beans.



*Foods containing a large amount of fats:*  
Nuts, nut products, eggs, olives.

The tuberculous patient must be taught that the absence of the sensation of hunger should bear no relation to the amount of food he must take and which will be properly digested and assimilated. He should be taught that he must take food not from a sense of taste or hunger, but from a sense of duty. Latham says that they must be made to eat what is given them, even if it takes two or more hours in doing so.

There are, however, patients who suffer from dyspepsia, and nausea, and a great repugnance for solid food. In such cases the necessary amount of solid food cannot at first be taken or retained. It may be necessary to trust for a time entirely to a fluid diet, such as milk alone, or with barley water, peptonized milk, koumiss, eggs in various forms, and preparations such as panopetine, plasmon, etc. But with fresh air and exercise, and with rest before meals, the appetite is good, and patients seldom have difficulty in eating the necessary quantities.

When well developed cases of tuberculosis

come under the physician's supervision, and recourse is had to a very strict course of hygienic treatment, great care has to be taken of the diet. In the various sanatoriums the general character of the food does not differ much, but the times at which it is given do. At the European sanatoriums there is a tendency to overfeed the patients, and wine and brandy is often allowed. At Nordrach the following system is carried out. Three meals are given every day, and nothing is given between times. Breakfast at 8 A. M. consists of tea or coffee, a large quantity of butter and bread (not new), cold meat, such as ham or tongue, or sausage, or occasionally raw scraped meat or cured salmon, with a pint of milk. Dinner at one o'clock, consists of two hot courses of meat, or sometimes one of fish and one of meat, about four to six ounces of each, with a large quantity of specially selected potatoes, containing an abundance of carbohydrate material, with fresh green vegetables or rice, and an abundance of excellent fat-containing sauces. The third course may be pastry, or some form of farinaceous pudding; on alternate days this may be replaced

by fruit, or ice-cream may be given. In addition the patient has a pint of milk, and at the end of the meal may have a cup of coffee. Supper is at 7 P. M. and consists of one hot course of meat with potatoes and vegetables, and one cold course of meat or fowl, with an abundance of bread and butter and cheese, and a pint of milk. Occasionally one course is replaced by a thick form of soup. At the end of the meal a cup of tea is allowed if the patient wishes for it. This does not seem to be an ideal course of diet, but may, however, be suited to the European climate.

At the Massachusetts Sanatorium, at Rutland, the following is the daily program. The heat, which is by indirect radiation, fresh air directly from outside being passed over steam pipes and fanned into the room, is turned on at 5 o'clock A. M. to warm the rooms for dressing. All patients not confined to their beds arise at seven and take at least a cold chest bath, often a plunge, as is directed by the physician. The flesh is first rubbed into a glow, then cold water applied. This is a most important part of the treatment, and soon the patients

feel it as much a necessity to their comfort as others do the bathing of face and hands. At all meals special diet is served when directed by the physicians; but the usual breakfast menu is a cereal, chops, steak or eggs, muffins and cold bread and butter, tea, coffee and milk.

By nine o'clock all are through breakfast and the care of beds, and are ready for outdoor exercise. This, as well as every other detail of the patient's life, is under careful surveillance. Exercise is taken in all kinds of weather, even when the temperature is below zero. Some are allowed to do considerable walking, while others lie in hammocks or lounging chairs. At half-past ten luncheon is ready in each dining-room; and every patient out of bed is supposed to be there. The luncheon consists of raw eggs, eggnog and milk. Then out of doors again for two hours, when dinner is served. This consists of a soup, a roast of meat (and on Friday fish), two vegetables, bread and butter, dessert, tea and milk. At half-past three is a second luncheon, and at a quarter of six is supper, consisting of a cereal, cold meats, bread and butter, sauce, tea and milk, and occasionally

cake. At quarter past eight is a last luncheon at which is given hot or cold milk. Lights are out at ten o'clock. During the afternoon patients are expected to be out in their reclining chairs or hammocks.

At the hospital for consumptives at Blackwell's Island, there are nine hours of sleep, and the patients eat nine times a day, as follows:

At 6 A. M., a breakfast of cereals, bread and butter, coffee and beefsteak or poached eggs.

At 8 A. M., cod-liver oil, with sherry wine.

At 10 A. M., eggnog.

At 12 M., dinner, consisting of soup, beef, or mutton, potatoes, another vegetable, and bread.

At 2 P. M., cod-liver oil and sherry.

At 3 P. M., beef-tea.

At 4 P. M., eggnog.

At 5 P. M., supper of pudding, a soft-boiled egg, bread and butter, tea.

At 8 P. M., hot or cold milk.

The results in this hospital are most encouraging. Of the 1,431 cases admitted in the course of one year, all of which were considerably advanced, having been brought thither from

Bellevue and other city hospitals, 378 were discharged as improved; 77 as much improved, and 27 as practically cured. Many of the patients now live in tents; during the winter a stove is placed at end of the larger tents. The result of this vigorous treatment is that of 81 cases, 55 showed increase in weight.

Dr. S. A. Knopf, the distinguished authority on consumption, gives the following *régime* for a consumptive accustomed to our American way of living. As soon as the patient awakes in the morning, while yet in bed, a glass of hot milk, half milk and tea, or half coffee and milk, with a slice of milk-toast, should be given him. After a little while he will rise to prepare for his douche, friction, or massage, whatever the physician's prescription may call for. After this it will probably be nine o'clock and the patient may take his ordinary breakfast. He should have eggs, and may have his choice as to the way they may be cooked—soft-boiled, poached, raw, etc., or in the form of eggnog with sherry or one or two tablespoonsful of whiskey. If he is accustomed to a meat breakfast, he should have broiled steak, chops,

poultry, sweetbreads, etc., or raw chopped beef. Bread a day old—preferably whole-wheat bread or French rolls, but not hot—with plenty of butter or honey, either milk, cocoa, coffee with milk, but not too strong, or a cup of bouillon, should also form part of the meal. Whether the patient likes to have his mush (cereal) for breakfast or supper may be left to his choice; some fruit should always precede the eggs or meat in the morning. If fish is served in the morning it should be either broiled, or boiled, or baked.

The patient should take the heartiest meal between the hours of twelve and two o'clock, (four hours after breakfast). Broth or soups should be the first course. Oysters and clams are most easily digested raw. Any kind of fresh fish may be served again at dinner, and in any form except fried; and there will be, of course, roast meat of some kind, rare roast beef, mutton, poultry, etc. Of vegetables, spinach is particularly to be recommended on account of the large proportion of digestible and assimilable iron. Next to this in nutritive power come lentils, peas, beans, cauliflower, potatoes.

Fresh vegetables should be given whenever it is possible to have them. Lettuce and other salads preferably prepared with lemon-juice instead of with vinegar, are permitted. Light puddings, fruits, and nuts may constitute the dessert.

About four or five o'clock some milk with toast may be taken, or, if the patient cares for it, he should have a cheese or meat sandwich. At this time the milk may be replaced by bouillon or chocolate.

The supper should not be quite so voluminous as the dinner: cold or warm meats, rice with milk as gruel, jellies, fruits, etc. At bedtime again a glass of milk or some milk toast.

Lucas gives the amount of food advisable to be taken by a consumptive, as follows:

Breakfast.—Half a pint of porridge, with 2 ounces of sugar, two rashers of bacon, and two eggs (or chop, steak, or fish); bread, 4 ounces; butter 2 ounces; half a pint of tea or coffee; milk, one pint.

Mid-day meal.—Soup (optional); fish, 3 ounces (or poultry), with butter, 2 ounces; two



or three slices of meat, 4 ounces; potatoes, 4 ounces; cabbage and other vegetables, 4 ounces; pudding (various kinds), 6 ounces; bread, 4 ounces; butter, 2 ounces; milk, one pint.

Evening meal.—Two eggs (or cold meat or fish); bread, 6 ounces; butter, 2 ounces; jam; half a pint of tea; milk, one pint.

There are occasionally patients to be found to whom meat is very abhorrent. Such persons will find the following preparations useful, as they contain a large per cent. of proteids: malted nuts, almond nut butter, or when they can be obtained, bromose, ambrosia, nuttose, nuttene, and maltol. (Foods prepared at the Battle Creek Sanatorium.) These foods may be properly styled tissue builders. They are easily digested, and contain considerable oil, which is always essential as an element of diet in the proper feeding of consumptives. Granose flakes, granose cakes, granola, whole-wheat zweiback, graham zweiback, are foods in which the starch is for the most part partially digested in the process of manufacture, and the proteid matter of the food is also made easy of diges-

tion. These foods can be digested by the weakest stomachs.

Innumerable cases have been reported of intestinal tuberculosis in children from using milk from diseased cows. One instance is reported, that in a young ladies' boarding-school five girls, the children of healthy parents, died of tuberculosis of the intestines, from using milk obtained from diseased cattle. The following are the precautions recommended by the National Association for the Prevention of Consumption.

1. Use a double milk saucepan; if, however, this cannot be obtained, put the milk into an ordinary covered saucepan, and place it inside a larger vessel containing water.

2. Let the water in the outer pan be cold when placed on the fire.

3. Bring the water up to the boil, and maintain it at this point for four minutes without removing the lid of the inner milk pan.

4. Cool the milk down quickly by placing the inner pan in one or two changes of cold water without removing the lid.

5. When cooled down, aërate the milk by stirring well with a spoon.

When treated in this way milk is rendered perfectly harmless.

A baby should never be suckled by a tuberculous mother, but by a healthy wet-nurse, or it should be fed with food which is absolutely free from suspicion of being contaminated by the tubercle bacilli. As the baby grows the dietary should contain more fat, and when the teeth have developed a very slight amount of starchy food should be added. During this period of childhood the diet should contain a greater portion of nitrogenous food, as it supplies the muscular force, which is demanded, owing to the increasing age of the child. As a rule, children do not drink enough water, as it is a great aid to nutrition, dissolving the food so that it can be more easily digested and assimilated, and acts as a solvent for effete material in the body so that it can be better eliminated.

## CHAPTER X.

### EXERCISE FOR CONSUMPTIVES.

Nothing is so essential to success in life as sound physical health. Physical exercise influences the growth and structure of the muscles of the body, and helps to remove any needless accumulation of fat, as well as useless waste matters, which may exist in the tissues. The flow of blood throughout the body is augmented, the respiration is improved, the lung capacity increased, and the size of the chest enlarged. Exercise stimulates and strengthens the organs of digestion. The appetite is improved, the digestion is more complete, absorption becomes more rapid, and there is a better circulation in the larger digestive and secretory organs, as the stomach and liver, and nutrition is in every way increased.

Exercise promotes not only the nutrition and

energy of the voluntary muscles of the heart, blood-vessels and respiratory organs, but it powerfully assists the aëration of the blood, and in this way keeps all the organs of the body in a healthy condition. It counteracts the mental depression, which has a lowering effect on the vitality of the body.

A person who has been accustomed to active physical exercise has so strengthened his vital capacity, that he is not only less liable to contract disease, but he is also better able to throw it off if he should be afflicted. But when a person's lungs are diseased the case is altered, and great injury is done when the physician insists too much upon exercise. No doubt there are many cases giving promise of complete recovery, who have simply murdered themselves with the mild exercises prescribed for them. In incipient pulmonary tuberculosis, patients kept in bed, in the open air, for three, four and five weeks, at the outset of their treatment are certain of the most beneficial results.

In regard to exercise, no hard and fast rule can be applied to all cases. Each case has to be treated on its merits. The height of the tem-

perature, the rapidity of the heart's action, ready tendency to exhaustion, extensive or rapidly advancing disease, or an irritable nervous system, all of these have to be considered. As Latham says: "We have to deal with individuals who may be allowed to walk five or more miles twice a day, with others who must be kept alone and at rest in bed all day, and with others who may take a slight amount of exercise in the morning, but who must rest for the remainder of the day."

A fairly robust person should have some active physical exercise, which should be gradually begun and increased, and preferably such as will keep the patient out of doors. The patient should cease exercise the moment he begins to feel a little tired. For excess after one feels fatigued does more injury than the previous exercise has done good.

When the temperature is higher than 98. 6° in the morning, and more than 100° in the evening, the patient should rest in bed all day, and should not leave his bed until his temperature has been below these levels for at least a week. There may, however, be exceptions to

this rule. If we find that exercise causes a marked increase in the pulse-rate, or brings on difficult breathing or profuse perspiration, then it is contra-indicated. In all cases absolute avoidance of fatigue must be enjoined.

The *rest-cure* as practiced at the present time is in a semi-reclining position in a steamer chair, or an adjustable invalid's chair, out of doors. The patient is made as comfortable as possible with the aid of cushions, rugs, etc., and in winter a hot soapstone is placed at the feet. Each sitting of two or three hours is interrupted by partaking of food, and a short walk of forty to fifty steps. In the summer time from ten to twelve hours, in the winter not less than six hours, should be spent in the open air. The bedroom windows are to be kept open summer and winter, so that the patient is practically continuing his outdoor life while sleeping.

As the patient improves, and the character of the country permits, ascents proportionate to the age and strength of the patient may be permitted. Avoid at first steep inclines, but as soon as practicable this is an admirable exer-

cise to strengthen the heart and relieve the difficult breathing, as it assists in expanding collapsed portions of the lungs, invigorating the circulation, and improving muscular strength, till finally really steep hills can be taken with ease. The patient must never hurry, even if caught in a shower, for any increase in the number of respirations does harm by increasing the work of the lungs.

Some patients are benefited by massage: others can walk with benefit only a few yards on level ground. Others, again, are benefited by driving slowly in carriages. Billiards, tennis, golf, and other games which involve much exertion and tend to excitement, are injurious. It is always well to take one hour's rest before the midday and evening meals, in order that the patient may go to his meals with his powers of digestion and assimilation unimpaired.



## CHAPTER XI.

### CHANGE OF CLIMATE FOR CONSUMPTIVES.

CLIMATE has in all ages been considered to exercise an important influence in the treatment of pulmonary tuberculosis, though opinions have differed as to the kind of climate which is most beneficial. In no department of medical practice has there been more hasty, ill-considered advice given than that regarding a change of climate for consumptives.

It is not an easy matter to decide what change of climate a given patient shall have, because of many varying considerations to be weighed, both as to patient and climate. The physicians who take the most factors into account, and weigh them best, will be the most successful in the management of each individual case. Change of climate requires much consideration, for not only serious inconven-

ience and great expense is often unnecessarily caused a patient and his family by hasty advice in this regard, but his condition is not infrequently made worse by the persons who are dependent on the associations and comforts of home and friends, for their happiness will not be likely to be benefited by being sent away, if especially alone and among strangers. One of the most woeful mistakes, and yet a most common one, is to send a tuberculous patient to a climatic resort where he will be left practically to himself, with no careful and constant supervision of his daily life. There is no doubt, however, but that climatic treatment is a most important remedial measure. Properly selected climates cause many arrests and a considerable percentage of cures. But early diagnosis by a competent physician is very essential, before the patient is sent away. Too many patients are sent away because the physician wishes to get them off his hands. Professor Bamberger concludes his *Lectures on Consumption* with these words: "Gentlemen, if your patients become weary of your skill, and you have exhausted the aid which your knowledge

can give, and you order them away, send them so far that they will never return. This rule you will find much to your professional credit." Consumptives in all possible stages, some dying before reaching their destination, are advised by physicians who ought to know better, to go "to some other climate," and encouragement is given that health may await them there.

Consumptives should understand that there is no specific influence in any climate. There is no climate on the face of the earth in which tuberculosis is not common among the native population; or where people do not contract tuberculosis and die of it just as they do here. Observation shows that different climates are suited to different cases. As a rule, the qualities which render a climate favorable are uniformity and dryness. A uniform cold climate is best in some cases, and a uniform warm climate for other cases. An experienced Boston physician has said: "Let us clearly keep this fact before us, that climate is but one factor, although an important one, in the treatment of pulmonary tuberculosis, and unless accom-

panied by good hygienic conditions, wise and constant medical supervision, it will, in many cases, prove but a delusion and a snare." A good rule has been laid down by physicians experienced in the treatment of tuberculosis, that as far as possible all patients should be treated under the same climatic conditions as those which they are likely to experience in their subsequent life.

It has been clearly shown by numerous investigators on the subject that damp cold is a fruitful causation of tuberculosis, and is highly injurious to those in whom the disease is already established. Trudeau by a series of experiments, demonstrated that rabbits inoculated with tuberculosis and confined in a damp, dark place, rapidly succumbed, while others turned out to run wild recovered or developed only slight lesions. Moist air enervates the already depressed consumptive, increases his expectoration and aggravates his cough, while dry climates have the opposite effect. Some patients improve in a warm or hot climate, others in a cold one; some at sea level; others in an altitude of rarefied air, but it is generally

considered that all tuberculous patients will improve to some extent in a dry locality with abundant sunshine and plenty of out-door life.

Hirsch has shown that damp heat has not a positive influence on the production of tuberculosis, but has a decidedly unfavorable one upon its progress when once established, while a damp, cold climate is not only a positive factor in the production of tuberculosis, but is highly injurious to those affected with the disease. While tuberculosis is not common in tropical or frigid zones, it is more prevalent in the former, where also it is more rapidly fatal.

As a rule, the robust are benefited by cold and altitudes, in addition to a certain amount of work, sometimes by roughing it, on cattle-ranches, lumber camps, etc. This is contra-indicated if the patient has a small or weak heart, a nervous temperament, or persistent high temperature. Those that need protection do better, as a rule, in warm and equable and comparatively dry places, at the sea level or but little elevated. Between these classes is a third to whom cold and a moderate elevation, say not

over 2,000 feet, proves stimulating and restorative. In all cases purity and reasonable dryness of the atmosphere is a desideratum.

For the last twenty years there has been an annual exodus of consumptives southward at the approach of winter. They are to be found in nearly every State from North Carolina to the Mississippi River. Patients with ulcerative tuberculosis, and those complicated by heart disease often do well in these climates, particularly among the pine regions. Patients with albuminuria should never be sent to high altitudes. Persons with a cavity in the lung are always positively harmed by residence at high altitudes. The heart's action, already rapid, becomes more so, and the hectic flush grows more marked. The energetic stimulation of the mountain air is suited rather to the phlegmatic than the nervous temperament, and individuals of the latter type often do very badly in it, when a lower altitude would have been beneficial.

A search through all the literature known resulted in finding some 9,000 cases of persons who had been subjected to a change of

climate for tuberculosis. In separating these into groups under the chief types of climate resorted to,—namely, ocean, island, seashore, lowland, desert (also lowland), and highest altitudes,—the two factors were clearly demonstrated that, as a rule, the subjects of tuberculosis improve in greater numbers as they remove from the sea to the interior of the continent, even when the elevation of the ground is but slightly increased. This proves very clearly that dryness is better than dampness, and that diminished barometric pressure is even more powerful than dryness in arresting the progress of the disease. So while it may be said that desert air is good, mountain air is better.

As to the results from the point of view of actual recovery, under one careful observer (Dr. Hichens), high-altitude treatment gives the following: 12 per cent. completely cured, 50 per cent. improved and half cured, 20 per cent. condition stationary, 18 per cent. condition worse, or died.

In the United States a moderately cool and decidedly dry climate exists only at an eleva-

tion of 4,000 feet above latitude 35° north. Colorado in summer and winter days furnishes such a climate. A climate which is moderately cool, but only relatively dry, exists at an elevation between 1,000 and 4,000 feet. Bethlehem, in the White Mountains, in summer is an example of this, but in winter it is cold and not dry. From purely a climatic point of view that portion of Central and Northern Old Mexico traversed by the Sierra Madres offers an excellent all-the-year-round climate. It combines the requisites of proper elevation, equable temperature, minimum atmospheric humidity, freedom from snow, a small annual rainfall, and, last but not least, comparative freedom from wind and dust storms. Coming north into New Mexico and Arizona conditions change somewhat, for better and worse, in some of the requisites of an ideal climate. The wind and alkali dust storms become serious objections, at certain seasons. According to the U. S. Weather Bureau Reports, covering a period of nine years, El Paso, Texas, in its altitude, relative humidity, number of days of sunshine and average temperature, offer induce-



ments superior to almost any other health resort in the world.

The prejudice against winter weather is proven to be entirely unfounded, as in many sanatoriums such climatic conditions are a well-recognized part of their treatment. Cold is not only stimulating and encourages needed exercise, but under certain conditions it may result in a desirable sedative effect. The sleep which comes at night after the day's exhilaration and excitement, induced by cold, is the most refreshing of all rest.

The following data may be of interest to those desiring a climatic change.

1. Climate cool and moderately moist, general elevation, 2,000 feet.—Western slope of the Appalachian chain, Adirondacks, Catskill, Allegheny and Cumberland Mountains.

2. Climate moderately warm and moderately moist.—Western North Carolina, Asheville, elevation 2,250 feet; western South Carolina, Aiken, Georgia, Marietta and Thomasville.

3. Climate warm and moist.—Florida (equable), Southern California, coast region (equable).

4. Climate warm and moderately dry, elevation about 2,000 feet.—Southwestern Texas, Southern California, inland.

5. Climate cool and moderately dry, elevation about 1,000 feet.—Minnesota, Nebraska, Dakota.

6. Climate cool and dry, elevation from 4,000 to 7,000 feet.—Montana, Wyoming, Colorado, northern New Mexico and western Kansas. In this group are to be placed Davos and San Moritz in Europe.

7. Climate warm and dry, elevation 3,000 to 5,000 feet.—Southern New Mexico and Southern Arizona.

## CHAPTER XII.

### THE SANATORIUM TREATMENT OF CONSUMPTION.

THE movement which originated in Germany some ten years ago, to provide proper sanatoria for the cure of the consumptive poor, found eager advocates in the medical world and open purses among the well-to-do. On the continent of Europe, are one hundred sanatoria for consumptive patients; of these Russia has eleven, France twenty-one, and Germany forty-three, while England, Ireland and Scotland have twenty-six. Germany to-day has sanatoriums for over 2,000 patients, and such institutions are multiplying in every country. Switzerland, Sweden, Belgium, Holland, and in Spain, Roumania and the Argentine Republic, even, the public agitation for sanatoriums for the consumptive poor has met and is meeting with

good results. England has accommodations for over 5,000 cases supported by charity only, leaving about 70,000 cases more unprovided for.

In this country, Massachusetts has spent \$150,000 on its sanatorium at Rutland. New York, Connecticut, Indiana, Illinois, Michigan, Rhode Island and a number of other States are seeking legislative aid for sanatoriums. We have reached agreement in two points, first the right of the State to insist that a tuberculous patient should not be a source of danger to others; and, secondly, the duty of the State, of civic authorities, or of private benefaction to provide suitable accommodation for the poor consumptive.

In August, 1891, the White Haven (Pa.), Sanatorium of the Free Hospital for Poor Consumptives was opened. The buildings of the sanatorium at that time consisted of a tumble-down old barn and a very dilapidated farmhouse, located on a tract of 215 acres of mountain land. By September there were fourteen patients. One hundred and sixty-nine days of treatment had been given with an aggregate

gain of sixty-seven pounds in weight. Buildings were added, and during the following year there were 156 admissions, only fifteen of the patients being incipient cases. Sixty-three had both lungs involved, and about ten per cent. had at least one other organ or tissue involved beside the lungs, such as a kidney, a testicle, the pleura, or the larynx. Very few had been tubercular for less than one year, many of them for two or three years, and a number for many years. In age the patients ranged from nine to sixty years.

The treatment at the White Haven Sanatorium is out-of-door life, a carefully selected diet, and regulation of exercise. The patients practically are kept in the open air for the twenty-four hours, irrespective of weather. At night all the windows in the pavilion are kept open, so that the air circulates freely throughout the sleeping apartments. Draughts are disregarded. Ample bed-covering is supplied to keep the body warm, and in cold weather bed-warmers are furnished the patients. In daytime the patients either sit out of doors or walk. The walk is graded accord-

ing to the strength of the patient. Each patient is required to take no less than three quarts of milk a day and no less than six raw eggs a day, and is advised to take as much more of this kind of food as he can. In addition to this food he is given a good dinner in the middle of the day and a very light breakfast and supper. The dinner consists of roast beef or beefsteak, vegetables, some light dessert, such as pudding, custard or ice-cream and fruit. The breakfast consists of some cereal, and in cold weather, hot milk or coffee. The supper consists of boiled rice and fruit, cheese, milk and eggs.

When the patients contracted colds, as they occasionally did when some one came into the sanatorium with a cold, they are at once put to bed and kept there until they are over the acute stage. As a precautionary measure the sanatorium has printed notices at the entrances of the grounds requesting people with colds to remain off the premises, as colds always come through contagion, and an epidemic of colds is liable to pass through the entire sanatorium.

The pulse and temperature of each patient

are taken and recorded night and morning, and the weight is taken and recorded once a week. These records give an indication for the regulation of diet and exercise and are carefully studied for that purpose. Patients who have a rise of temperature and disturbed pulse-rate are not permitted to take any exercise. Unless a patient gains weight, his diet is incorrect, and an effort is made to correct it.

For sanitary reasons each patient is provided with a spit-box and with paper napkins. When possible, expectoration must always take place into the spit-box, and, when this cannot be done, into a paper napkin. Paper napkins must always be used for wiping the mouth. Every day the paper spit-boxes with their contents, and the paper napkins which have been used are burned. For convenience each patient is supplied with a paper coffee-bag into which he places his soiled paper napkins. Expectoration upon the grounds of the sanatorium is made a cause for expulsion.

Says Dr. Lawrence F. Flick, in summing up the result of first year's work at the White Haven Sanatorium: "We are taught some

valuable lessons. That tuberculosis is curable under the most primitive conditions, provided the patient is kept out of doors and given plenty of the right kind of food. The comforts of life are of a secondary consideration, and exposure to weather and cold may be disregarded. . . . That tuberculosis is seldom recognized in practice until it is far advanced, and that many patients continue to work when they have more than one important organ of the body involved. The subjects which have been sent to White Haven have all been sent under instructions to send only early stage cases, and yet many have had not only both lungs involved, but have had involvement of the kidneys or some other inter-abdominal organ. Systematic examination of the urine for tubercle bacilli has revealed involvement of the kidneys in a surprisingly large percentage of patients admitted."

Few of the guests remain at White Haven over six months, yet in that period the records show that fully fifty per cent. of the total number leave apparently restored to health. After going to their homes they are carefully watched for any signs of the disease returning, but thus



far the restoration has been so complete that only a very small percentage have had a relapse.

At the Adirondack Cottage Sanatorium there are now twenty separate cottages and can accommodate over one hundred patients. During the past fifteen years it has cared for 1,200 patients, one-third of whom were advanced cases. Of the whole number, twenty-three per cent. were discharged cured; fifty-six per cent. were discharged with the disease arrested; nineteen per cent. were discharged with the disease stationary, and two per cent. died at the institution.

At the Loomis Sanatorium at Liberty, New York, during the past year, thirteen per cent. of the patients discharged were apparently cured. From the last reports accessible, during six months twenty-three per cent. were discharged as cured, and seventy per cent. of those discharged were either cured, had their disease arrested, or were so much improved as to be able to return to their work.

The Massachusetts Sanatorium at Rutland, shows out of 141 persons treated, fifty-six departed apparently cured, while thirty who were

unable to remain longer were so greatly improved that the majority have literally healed themselves. Of the 141, seventy-five were in advanced stages, all of the symptoms being prominent. During the year under consideration only two succumbed to the disease, in spite of the many who were considered by their own physicians as hopeless cases.

The Sanatorium is 1,600 feet above the sea. There are now over two hundred beds. The building occupied by patients is one story in height, each ward containing twenty-two beds, with some rooms for the isolation of those developing severe complications. At the end of each ward is a room having three sides of glass, in which the sun baths are taken, the windows being arranged so that they can be opened at will, while beyond these are large piazzas having three exposures. These piazzas are filled with lounging chairs, summer and winter, for it is only in stormy weather that the patient cares to withdraw into the sun room. Great care has been taken to have the system of heating, ventilation and sewerage as perfect as possible. The corridors have no stairs, but fol-

low the natural grade, and the corners are rounded, preventing the accumulation of dust. The wards are under the supervision of hospital trained nurses.

The last report of the Sharon Sanatorium shows equally good results. Out of forty-two patients who left it during the year, in twenty-three the disease was arrested, while sixteen were greatly improved. Of the twenty-three relieved the cough and the fever entirely disappeared, and an examination showed that no germs of tuberculosis whatever were in the sputa.

There can be no question but that the sanatoria treatment of tuberculosis offers the surest means of regaining health, and permits the attainment of the best results possible in any given treatment. The sanatoria treatment has a double function, the removal of a source of infection and in this way lessening the spread of the disease, and secondly, returning a cured patient later to the community who will act as an educator in the community in the great principle of preventing disease. The great benefit of a sanatorium is that there is a careful regu-

lation of a patient's life in all its hygienic and medical details, and it is the attention to detail and to the avoidance of what is harmful that this form of treatment for tuberculosis owes its extraordinary results, and its superiority over all other methods. If all consumptives could be treated in sanatoria for three months during the earliest stage of the disease, and taught to preserve the health there regained, very few would reach the dangerous advanced stage. The benefit of going to a sanatorium, if only for a brief time, is that the patient learns the necessary routine and the immense importance of apparently insignificant details.

It must be remembered that the sanatorium treatment has its limitations: in many cases it can arrest the progress of the disease, and stamp out the tubercle bacilli, but it cannot create new lung tissues, nor restore an extensively diseased lung to its full working capacity. Therefore it is unadvisable to send unsuitable cases to sanatoria, when they are in a helpless or incurable condition, and need all the comforts of a home. Individuals with extensive cavities in both lungs or with the persistent diar-

rhœa of intestinal tuberculosis should not be sent to a sanatorium, nor should cases with high fever and great debility, at least, not until these symptoms have yielded to treatment.

## CHAPTER XIII.

### HYGIENIC AND PROPHYLACTIC.

THE most important sanitary problem of to-day is that of the prevention of pulmonary tuberculosis, but proper measures for the suppression of this disease cannot be enforced until the public in general, and especially that portion of the people who either has the disease or is intimately associated with those suffering from it, become educated on the subject. To that end each and every case of tuberculosis should be reported to the health officer or to those whose business it is to look after the sanitary affairs of the State. The people must be taught that tuberculosis is by no means a necessarily fatal disease, but that on the other hand, the large majority of cases, if taken in time, can be cured.

Dr. George W. Webster, President of the Illinois State Board of Health, has presented

some important rules to be observed, showing how a case of tuberculosis may be made perfectly harmless to others by preventing the sputum from becoming dust.

1. Indoors: The greatest care is necessary. Dust in closed places is the dust which infects. Use a spittoon containing a little water (not sand or sawdust), or spit into a rag or piece of paper, to be burned at once or thrown into the water-closet.

2. Out of doors: Dust is not so readily formed in our damp climate (this applies to Illinois), and it is disinfected by sunshine and fresh air. It is therefore better to spit on the ground than into a handkerchief, or into anything which is apt to be put into a pocket, except a special spit bottle, such as may be had for a small sum. Failing this, spit into a gutter, never on the pavement, and never in a tramcar, bus, cab, or railway carriage. Never swallow the spit; it may affect the bowels.

3. If a handkerchief or other article is soiled with tuberculous spit, keep it wet until it can be washed or boiled.

4. Empty the contents of the spittoon down

the water-closet, and clean the spittoon with boiling water. A little carbolic acid will kill the flies; these carry off the infective matter.

5. In cleaning rooms occupied by consumptives, capture the dust with damp duster and tea-leaves, or damp sawdust used in sweeping. Do not chase it about or stir it up. Boil the duster; burn the sawdust and tea-leaves.

6. No spoon, cup or other article which has been applied to the mouth of a consumptive ought to be used by a healthy person until it has been carefully washed. The remains of food left by a consumptive ought not to be used by the healthy.

7. No consumptive ought to kiss or be kissed, except on the cheek or brow.

8. No consumptive mother should give such kisses.

9. Consumptive persons ought to have a bed by themselves.

10. Consumption is not communicable by the breath or perspiration.

If these precautions are attended to there is no danger to the healthy in the ordinary intercourse of family or society.



As to disinfection the following positive regulations are proposed:

All rooms occupied by consumptives should be kept scrupulously clean. Unnecessary draperies, carpets, etc., should be dispensed with.

If sputum or other discharges accidentally fall on the floor or walls, the spot should be cleaned immediately with boiling water, the rooms and all the furnishings should be thoroughly disinfected as often as every four weeks at most.

All premises or rooms, sleeping-car or steamer berths, occupied by a consumptive in a home, hotel, car or hospital, should be as thoroughly disinfected before it is occupied by another as it would be in the case of small-pox. This should not be attempted by any one except some person properly qualified.

All personal clothing, bed linen, handkerchiefs, etc., belonging to a consumptive should be washed by themselves and very thoroughly boiled.

All dishes, spoons, knives and forks, etc., used by him should be thoroughly washed and boiled before being used by others.

We have found that it is possible, with proper hygienic surroundings, pure food, plenty of fresh air, and exercise to keep our bodies in such a condition of health that even though we are surrounded on all sides by poisonous germs—messengers of death—they can have no effect upon us.

Fifty years ago Dr. Calvert Holland wrote that “whatever arrests, impedes, or unduly excites the functions of the skin must inevitably lay the foundation of disease.” It naturally follows that if we do not free the skin from impediments or from anything that unduly excites it we cannot hope to remove the foundations of disease. The relaxed, oversensitive skin, unbalanced circulation, and irritable nervous system of the consumptive is a matter of daily experience to every physician. There is always a deficient action of the skin, which makes tuberculous subjects easy to take cold, and prone to pulmonary engorgements. It is of the first importance that the patient becomes accustomed to cold water to stimulate and refresh the nervous system, and thus improve the patient’s resisting power.

The stimulus of cold water to the cutaneous nerves, the deepening of the breathing, the equalizing and toning up of the circulation, the stimulation of the appetite, and the general sense of well-being it produces, are all desirable to those who have tried it fairly.

Water is to be used according to the patient's age, temperament, and strength, the stage of the disease, the condition of the heart and vessels, the individual reaction, the climate, and weather. Therefore it must be begun gradually and cautiously, with variations to suit each individual case. The patient begins with water at  $100^{\circ}$  by the thermometer, and its temperature is reduced each morning by one degree, till the final temperature, varying with the case from  $70^{\circ}$  to  $55^{\circ}$  F., is reached. In this way there will be no shock to the system, and the patient becomes easily accustomed to the bath. When this is regularly taken in the morning the surface of the body becomes inured to a degree of cold greater than it is likely to encounter during the remainder of the day.

There is no better stimulus to the nerves than

a good spinal douche in the morning. A pail of cold water, a large sponge, and a Turkish towel is all that is required, the result will be a glow all over, and an inexpressibly delightful feeling of invigoration and strength, with a driving away of that languor and weariness with which the consumptive so often rises.

## CHAPTER XIV.

### THE COUGH OF CONSUMPTIVES.

THERE can scarcely be a greater mistake in medical practice than the routine treatment of pulmonary tuberculosis with cough mixtures. It only leads to destruction of appetite, disordered digestion, increase of sweating, and all the numerous ills resulting from retained secretion. It is almost beyond belief that monsters in human shape will persist in putting up mixtures for the cure of tuberculosis, opium being their chief ingredient, and by palliation of the cough beguile the ignorant to a slow but sure death.

“Cough mixtures” and “Consumption cures,” kill more people than a civil war. Belladonna and morphine, which are so often used to allay the cough, act as a paralyzing agent

upon the nerves, but in no way relieve the difficulty. No cough remedy ever yet sold as a patent medicine has afforded any real, radical good, in any single case; but does, in all instances, by interfering with, and deranging the action of the stomach, liver and bowels, aggravate the malady and render it more speedily and certainly fatal.

In the majority of cases, cough is a telegraphic signal that the train has been fired, that tubercles have been deposited, and are taking an irritative and inflammatory action, which is the stage immediately preceding actual decay of the lungs, while many persons have observed no cough at all, until within a few weeks of death; to the lay mind, the cough is the main characteristic of tuberculosis.

The cough is the most powerful attempt of nature towards recovery, and without which no patient could ever get well. A cough is the alarm bell, as well as the means by which disease and decayed parts of the lungs are removed, and room made for air and for life. If a patient suffering from tuberculosis succeeds in arresting the cough for a time, he thereby

forms secondary tubercles (acute miliary tuberculosis), to appear in the lungs, and, finally, all through the glandular system.

The cough of tuberculosis is symptomatic, not so much always of the tuberculous process in the lungs, as of inflammatory lesions and irritation of the mucous membrane of the bronchial tubes and upper respiratory passages. Cough is also often due to reflex irritation, especially from sources other than the air passages, without any need of expectoration; from accumulated fluid, or from other conditions such as catarrh of the pharynx, tracheitis, laryngitis, bronchitis, etc. There is often a temporary cause for a cough, operating at a distance from the lungs, such as indigestion, disordered liver, cold feet, or elongated palate. One can thus see the amazing folly of the people who purchase cough medicines and take them indiscriminately for the cough, regardless of the nature of its origin or its locality, whether in the spine, the liver, the stomach, the throat or the lungs. In every case cough is a spasmodic action, occasioned by exciting the branches of the pneumogastric nerves, and caus-

ing simultaneous reflex movements in the bronchial tubes or muscles of the chest.

Drugs should never be given until all other measures have failed, and then never without considering the question whether in treating the symptoms we are not aggravating the disease. The cough which occurs in the morning and is accompanied by expectoration is useful, and must never be checked by a sedative, but may be aided by a warm drink.

There is no better treatment for the cough of tuberculosis than the open-air treatment. Dr. Latham, who spent a few weeks at the Nordrach Sanatorium, said that during the time that he was there, he hardly ever heard one of the sixty odd patients in the various stages of tuberculosis cough during the day time. Patients in whom the disease was advanced occasionally had to get rid of expectoration, but this was done without any cough in the ordinary sense of the term. Many individuals who go to a sanatorium with a cough, lose this symptom in a few weeks.



## CHAPTER XV.

### THE HEMORRHAGE OF CONSUMPTION.

THE coughing and raising of blood is not an uncommon occurrence, and is considered by many persons, even by some physicians, as a sure indication of lung disease. There can, however, be no doubt that people do suffer from hemorrhage without presenting any signs of disease, and without subsequently developing tuberculosis. Ware states that out of 386 cases of hemorrhage seen in private practice, 62 recovered, and did not at any time develop tuberculosis. In eight out of every ten cases, the blood comes from the trachea, or large bronchii, and not infrequently from the posterior part of the nose.

When the bleeding comes from the bronchii, the lower down the source, the more serious it

becomes. It is not difficult for the experienced physician, from the appearance and color of the blood, to tell very nearly from whence it comes. Very bright colored blood almost always comes from the bronchial vessels, and the lower down it originates the more it will be mixed with the mucous. When blood comes from the lung tissue, it is always very dark, and comes up pure, and generally in profusion.

Every one should bear in mind that a really dangerous lung-bleeding almost always carries off the patient very quickly; but that in most cases there is no immediate danger whatever, and that a fright under the circumstances will injure the patient more than the loss of blood sustained.

Hemorrhage occasionally occurs from the lungs or stomach without any marked evidence of lung, stomach, or liver disorder. It may occur in the early stages of pneumonia, and the last stages of cancer; in bronchitis, pleurisy, abscess or gangrene, or in ulceration of the bronchii, and in some affections of the heart and large blood vessels. There are also cer-

tain hemorrhagic fevers, and also vicarious menstruation.

In a great many instances patients have been injured more by their respective physicians, by their using strong styptics, than they would have been if left without medical treatment. A little salt or a small amount of vinegar can do no harm. Drugs which promote the contraction of blood vessels are injurious, and only tend to increase the hemorrhage. Ergot raises the general blood pressure, and probably does not cause contraction of the arteries in any part of the body except the uterus. Digitalis should only be prescribed when the action of the heart continues to be unnecessarily rapid. Ice bags should be applied to the heart and not to the lungs. A blood vessel very readily contracts itself; and a clot artificially produced by the use of styptics, sometimes prevents the contraction of the blood-vessel, and occasions secondary bleeding. To cause a coagulation of the blood, especially in the smaller bronchii, can be productive of no benefit, but rather of serious injury to the patient.

However, whenever a hemorrhage occurs,

the case should be viewed with suspicion, and every means should be taken to make a positive diagnosis, and frequent examination of the sputa should be made to demonstrate the presence of tubercle bacilli.

## APPENDIX I.

### THE PREVENTION OF CONSUMPTION AND OTHER DISEASES.

THE science of life reveals to us the fact that man is born to health and longevity, that disease is abnormal, and death, except from old age, is accidental, and that both are preventable by human agencies. As measured by the ratio of average length of life and period of growth among other animals, man should live considerably beyond one hundred years.

It is difficult to explain why an intelligent appreciation of disease, and a reasonable knowledge of the ordinary means of its prevention, are so slow in forcing themselves upon the attention of communities. The people ought to feel that when preventable diseases, such as consumption, typhoid fever, diphtheria, etc., occur, somebody is to blame for it.

It is true, that the people are beginning to be educated to an appreciation of the fact that a homestead built on undrained soil is the certain abode of death; and that houses with their water supply and privy-vault in close proximity, are nothing less than highwaymen who watch for their lives. Seven tenths of all forms of illness and disease originate directly or indirectly from unsanitary surroundings, bad food, bad air, and unhygienic ways of living in general. A tenement-house district in large cities is a veritable plague spot; it is not only an evil to the people who dwell within its precincts, but a menace to the city, to the commonwealth, to civilization itself. It is here that the average death rate is the highest, and the average life rate the shortest. Here are to be found the largest number of lunatics, idiots, imbeciles, drunkards, epileptics, thieves, prostitutes, criminals of all sorts, and defectives of all classes.

But even with good sanitary surroundings, there are thousands of people who are invalids as the result of some fault of constitution. A philosopher has said, "It is the greatest of

all human felicities to be well born." It is, however, yearly becoming more and more apparent that an increasing proportion of human beings are badly born. How many persons do we constantly meet with flat or narrow chests, weakness of the heart, a neurotic temperament, feeble digestive powers, and various idiosyncrasies of mind and body. The curriculum of our public schools is loaded with much that is of no practical benefit, while the really important studies, such as physiology, hygiene, and dietetics, are barely mentioned. Our schools, seminaries, and colleges formerly every year turned out a lot of young men and women maimed in body by the neglect of physical exercises. Frances Willard said that it is a relic of primitive barbarism that children are taught a list of prepositions and the names of the rivers in Thibet, but are not taught the wonderful laws on which their own bodily happiness is based. The consequence is that people violate every law of their being, yet they expect and desire to live to a ripe old age.

Half of the sin, moral depravity, and wickedness of this world, grows out of physical dis-

ability. We find in every community degenerations from the normal type, developed under the influence of climate, soil, habits, manners, occupation, use and abuse of stimulants, narcotics, etc. The degenerations consist of imperfections of bodily organs, deviations from the normal type and proportions, and feebleness in the performance of functions. It is from this unfortunate and numerous clan that disease of all kinds selects its readiest and most incurable victims. We know that children inherit not only the general form and appearance of their parents, but also their mental and moral constitutions, not only in their original and essential characters, but even those acquired habits of life, of intellect, of virtue, or vice, for which they have been remarkable, therefore an acquired and habitual vice will rarely fail to leave its trace upon one or more of the offspring, either in its original form or one closely allied. The habit of the parent becomes the all but irresistible instinct of the child. "Who did sin, this man or his parents?" is a question daily asked, in one form or another, at the bedside of the sick.

Thus we see that man's physical, mental, and



moral character is a matter of heredity. The complete mental and physical bankruptcy which leads a man to the insane asylum or almshouse infirmary may be simply the result of two or three generations of sins against the body and soul on the part of profligate or diseased ancestors.

Says Dr. Kellogg: "Through the almost universal ignoring of the duty devolving upon every human being to preserve intact, as far as possible, the natural powers transmitted to him from his ancestors, and by training and painstaking development, make the most of them, we find the human race deteriorating in physical stamina, and a rapidly growing multitude of 'disinherited' individuals who are born into physical, mental, and moral bankruptcy. It is high time that society gave more serious attention to this great class of bankrupts by heredity, from which springs the greater share of crimes and criminals, cranks, lunatics, fanatics, and imbeciles."

The shores of modern times are becoming strewn with nervous wrecks, owing to the emotions being constantly over-wrought, the nerves

constantly on a strain, and the whole nervous system kept at a high tension, in the mad struggle for wealth and social position. People are constantly transgressing every known law of physiology, setting natural laws at defiance, and then wonder why so many die of apoplexy, Bright's disease, or other fatal malady. People should begin to realize that to disbelieve in the efficacy and the sacredness of the laws of nature is heresy, both spiritual and scientific.

Nothing causes so much human woe, blights so many hopes, crushes so many hearts, and destroys so much human happiness, as disease, and disease brought on by one's own transgressions; and yet men have their bodily health as much entrusted to their own keeping, and as completely within their own control, as they have their moral character.

With nervous diseases multiplying in variety and increasing in numbers, and insane asylums adding extensions, it is evident that the sanity and vital stamina of the race is in the rapid decline, and the causes which are leading to this result are themselves on the increase. It

would be harder to find a grimmer comment upon the educational methods of the day, than the statement of Dr. Ernest W. White, one of the most distinguished authorities on mental diseases, that the "strain of education" is the most prominent cause of the increase of chronic insanity.

The whole object of the treatment not only of consumption but of many other diseases, is to fortify the patient's constitution against the inroads of disease so that the individual cells of the body have the stamina to fight against and destroy not only bacilli, but the causes of other maladies.

Owing to errors of diet, unhealthful surroundings, or a hereditary predisposition, not every person has a body in a condition to repel disease. Let a large number be simultaneously exposed to contagion; one portion would sink under its influence; another would be severely affected; still another, and perhaps the largest, would suffer moderately; while a few, or many, as the case might be, would pass unscathed, entirely unaffected by its presence. In every person of good health, there is a vital

force normally working because of reasonably favorable conditions. This reserved or vital force seems a preliminary necessity to the possibility of disease, or at least to recovery from it. Without this reserved force, ordinary functions would be in constant danger of interruption or absolute destruction. With it, the severest malady may pass through all its stages to perfect recovery, without, in the end, greatly injuring the individual. Yet the strenuous life of the present day, the unphysiological life led by the great majority of people, the bad dietary, alcoholic excesses, hereditary affections, insalubrious professions, and unhealthy localities, are constantly sapping the vitality, and thousands have no reserve force to withstand disease. Healthy individuals possess certain degrees of immunity to tuberculosis as well as other infectious diseases, and this immunity is transmitted to the offspring. If one parent is tuberculous this immunity is weakened; if both are tuberculous, the immunity is lessened to a greater degree, and there is engrafted on the progeny a cellular nutritional weakness which permits the invasions of the infective germ.

Hence people with this inheritance, should use every means in their power to acquire a certain amount of reserved force so as to be able to withstand the inroads of disease.

Health comes from adherence to simple temperate living, with attention to diet, ventilation, personal cleanliness, out-door exercise, and proper sanitary surroundings. These should be and are within the reach of all. We have not simply organs to build and repair and supply with energy, but we have through the nervous organization, sensibilities and the higher intellectual and spiritual faculties, and the right exercise of those depends upon the right nutrition of the body. And here we have a most fruitful subject upon which it could be very easy to write a book, for the most fruitful source of degeneration is to be found in the nature of the food consumed. It has been said that prayer for moral rectitude and an utter ignorance of dietetics are an absolute and illogical combination.

We must always bear in mind, as Dr. Minor has well said, "No man can treat tuberculosis long and not realize that nothing which in the

least degree upsets the stomach, that very citadel of the consumptive's defenses, can, whatever its theoretical advantages, be anything but a curse to his patient." Impaired digestion, resulting in impoverishing of the blood, defilement of the tissues by an excessive production of ptomains and other toxic substances in the alimentary canal, is undoubtedly the starting-point of many cases of consumption, by furnishing the soil upon which the tubercle bacilli grows. Dr. Page of Boston truly says, "dyspepsia is incipient consumption." Good digestion is the base of perfect nutrition. A writer has said, "The best food in the world, imperfectly digested, will not be so useful to the animal body as the poorest food well digested."

Many of the illnesses with which the middle and latter part of the lives of more than one-half of the human race is embittered, is due to avoidable errors in diet. The human misery for which modern cookery is responsible is beyond calculation. A large proportion of the culinary literature of the day is simply rubbish. No doubt thousands of persons owe their ill health to the "lady in the kitchen." A

writer has said, "the Lord has provided plenty of good food for us, but the devil has sent along an army of bad cooks to spoil it all."

The sauces and vinegars, the relishes and dressings, the salads and sweets, innocent in themselves, but habitually used and abused, poison the nourishment of the body, enfeeble the circulation and weaken the vital existence. How many people we meet who are yellowed over with "biliousness," born of mince pies, fried sausages, Saratoga chips, and hot pungent ragouts, entrées, and dyspepsia-breeding salads, hot sauces and desserts? Is it any wonder so many thousands of persons are troubled with headaches, neuralgia, rheumatic and gouty twinges of nerves and muscles, colic, and dyspepsia? Fat-soaked, soggy food is not conducive to mental sanity, nor can we expect a wholesome view of life from the dyspeptic. How can a clergyman who has ruined his digestion by the use of hot biscuits, wheat-bread, pancakes, fried doughnuts, rich cake and pastries, preach any religion except one of fear, doubt, sorrow, pain and suffering, or future torment? Total depravity is often nothing but

total indigestion. Voltaire affirmed that the massacre of St. Bartholomew was due to the incapacity of the king to digest his food. Indigestion caused by bad cooking paralyzed Napoleon in two of the most critical battles of his career.

The evils which result from imperfectly cooked starchy foods are almost innumerable. Such foods remain in the stomach practically undigested, until they become sour, forming acids which irritate the mucous membrane and set up catarrh of the stomach, and when these acid contents are passed into the intestine, further irritation is produced. Mushes are responsible more than any other food for the production of dyspepsia. Oatmeal in the form of a paste is unfit to eat. Rice forms a chief article of food for about one-third of the human race. The starch of rice is very easily digested, owing, perhaps, to the fact that the amount of woody matter around the cells is very small.

The refined white flour with which the modern millers furnish us is an abomination. All of the life-giving properties have been eliminated, and there is nothing left but starch, which



contains but a very small portion of the principles necessary for the sustenance of life. The present enormous consumption of white wheat flour is undoubtedly a great evil. It breeds disease which ends in death. Unless checked and reduced to proper limitations it will leave a blight upon our national physique, undermining our vitality and in time deteriorating our national character. Much of the bread that is served on the average table, instead of being so thoroughly baked as to make it the "staff of life," is so doughy and indigestible within as to make it a menace to health. It is too much to suppose that the body has the power to perform such a miracle as to transform this dough into wholesome blood, sound brain, and strong muscle.

Pastries should never be eaten by persons who wish to have a good digestion. How many hours are spent in whipping cream, manufacturing cake, and beating eggs for puddings, pies and frostings, ornamenting merely to please the eye and the palate for a brief time, and for which much physical suffering follows, to say nothing of doctor's fees. Cake is innu-

tritious, and deranges the digestive organs sooner than any other article of diet, and 'a large proportion of the headaches and stomach ailments with which women are so constantly afflicted are the legitimate results of cake eating. Pies are a very indigestible food. and are the cause of a good deal of dyspepsia. The pie-foundries of Boston alone turn out over thirty-thousand pies every day, and it is estimated that a million of these abominations are daily consumed in that city. Emerson said, "Every man would be a poet if his digestion were perfect." Emerson was a great sufferer from dyspepsia, and can we wonder at it when we learn that he ate pie for breakfast? Said Bayard Taylor, "I believe that fat pork and pies have killed more people in the United States than dram drinking has." The deterrent influence of soda upon the gastric and pancreatic secretions suggest the vast mischief which is being done by the almost universal use of baking powders, saleratus, and salsoda in the making of bread. Soda diminishes both the gastric secretion and that of the intestinal glands.

It would be a blessing to the race if potatoes were banished from the planet and the more easily digested rice substituted. Says Dr. Cyrus Edson, ex-president of the New York Board of Health: "The potato being largely composed of starch instead of undergoing the chemical-vital changes of digestion, decomposes, evolving noxious gases, which distend the stomach and intestines. The lack of porosity of the potato substance is another factor that increases its indigestibility. It is precisely like a heavy bread and can only be acted on slowly from the outside. The practice of feeding potatoes to infants and young children cannot to be too severely condemned." People who live upon starchy foods, such as potatoes, and white bread, pastry and cakes, are in a more or less constant state of brain exhaustion. Starch is one of the most fruitful causes of dyspepsia.

The following foods are difficult of digestion and should be avoided. Crabs, lobsters, salt fish and fried fish, pork, sausage, veal, smoked meats, fried meats, spiced or potted meats, raw cabbage or cold slaw, salads, boiled or fried white or sweet potatoes, beets, all

forms of warmed-over food or hashed meats, or ice cream. Canned vegetables are often objectionable and cannot be eaten without bad consequences in many cases. Oatmeal, breakfast cereals, *if well cooked* and eaten with butter and salt, agree with many, while, on the contrary, if eaten with sugar and cream will cause distress. Griddle cakes are indigestible.

Of all animal foods, no other kind is so largely used as pork in its various forms of preparation, and yet it is not only unfit for food, but is one of the prime causes of many maladies. Dr. W. E. Howe, an inspector of one of the great abattoirs in Chicago, says that the diseases most frequently found in hogs by the inspectors are hog cholera, swine plague, tuberculosis, metritis, peritonitis, pleurisy, pneumonia, tumors, and nephritis. In many instances hogs were also found to have died just previously to the time of slaughter. The dangers to which the public is exposed from the use of these disease-ridden animals may be better appreciated when the fact is made known that the hog-cholera bacillus gives rise to the production of ptomains and other poisonous sub-

stances. Tuberculosis is very common in hogs. The flesh of a tuberculous pig contains a poisonous substance, tuberculin, which, when the flesh is eaten, may be sufficient to produce deadly effects in certain cases. Lard is nothing more than an extract from a diseased carcass. We find in a fat hog, glands which are large masses of scrofulous tissue. Tubercles are usually found in the lungs, and in seventy-five cases out of a hundred the liver is filled with abscesses. In yet a larger percentage will be found the same diseased products which seem to infect every organ, every tissue, and every structure. These rotten, diseased, scrofulous livers are considered a great dainty by many people.

Says Dr. Kellogg: "Just under the foul and putrid skin we find a mass of fat from two to six inches in thickness, covering a large portion of the body. Now what is this? Lard, says one; animal oil; an excellent thing for consumptives; a very necessary kind of food in cold weather. Lard, animal oil, very truly, and, we will add, a synonym for disease, scrofula, torpid liver. Where did all that fat come

from? or how happened it to be so heaped up around that poor hog? Surely it is not natural; for fat is only deposited in large quantities for the purpose of keeping the body warm in winter. This fat is much more than is necessary for such a purpose, and is much greater in amount than ever exists upon the animal in a state of nature. It is evidently the result of disease. So gross have been the habits of the animal, so great has been the foulness of its body, that its excretory organs,—its liver, lungs, kidneys, skin, and intestines—have been entirely unable to carry away the impurities which the animal has been all its life accumulating. And even the extensive system of sewerage, with its constant stream, from foul ulcers on its legs, was insufficient to the task of purging so vile a body of the débris which abounded in every organ and saturated every tissue. Consequently this great flood of disease, which made the blood a black, turbid current, was crowded out of the veins and arteries into the tissues, and there accumulated as fat! Delectable morsel, a slice of fat pork, isn't it? Concentrated, consolidated filth!"

The great majority of people of sedentary habits eat too much. Two meals a day are much better than three. It has been said that the American people are actually eating themselves into their graves. The failures to fit the food to the demands of the body, and especially the consumption of certain kinds of food, are the sources of untold injury to health and happiness. How many thousands there are who eat not for the purpose of nourishing the body, but merely for the pleasure of gormandizing. The result is that from two to five times as much food passes through the alimentary canal as is necessary to maintain weight and strength, and mind and body are actually weakened by the strenuous efforts made by the system in endeavoring to rid itself of this excessive amount of food. The result of so much gormandizing is a perverted taste for good wholesome food, and foods have to be spiced, seasoned, pickled, and otherwise doctored in order to satisfy a momentary gratification.

Where a person systematically overloads his stomach with a great variety of highly seasoned foods, the poison-destroying functions of

his liver and the poison-eliminating capacity of his kidneys are taxed to their utmost to keep the proportions of ptomains and leucomains in the tissues down to a point which will permit the performance of vital functions. Sufficient toxins are formed in the system every day to produce death. Hence the absolute necessity of eating just the proper amount and kind of food, and of keeping the liver, kidneys, lungs and skin in a condition to eliminate the poison. Faulty excretion is the foundation of disease. Habitual gormandizing fills the blood with half-digested food, which lodges in tissues and organs, and disease is the result. Sooner or later those organs must break down, and the whole system become a wreck. Most diseases of advanced life are due to interruptions in the processes of waste and repair.

Modern researches have shown that not only nervous maladies and functional disorders of various sorts, but the majority of tissue degenerations which lead to such maladies as Bright's disease, and like affections, are really due to the nutritive disturbances set up by the various toxins received into the body, or devel-



oped to excess within the body. The slightest deviation from true physiological conditions carries us into pathological ones, and disease and death is the result. Even the normal, healthy products of one part of the body would kill if they should be suddenly and unchanged carried into another and not very remote part.

Oxidation destroys all noxious impurities in the blood. By means of oxidation the food and the cells are slowly burned and heat is produced. Some of this heat is used to warm the body, and some is changed into power which enables the body to do work, either of motion, or of manufacturing the various products of the body, or of thought. The work of the heart requires one-sixteenth of all the heat produced in the body; the respiration requires one-sixtieth, digestion and absorption requires a smaller amount. An ordinary day's work requires three sixteenths the total amount of heat. So nearly three fourths of all the heat produced is used simply to heat the body. In a state of health the temperature of the living body is about  $98\frac{1}{2}^{\circ}$  F., and this is maintained with slight variations throughout life. Indeed a

change of more than a degree above or below the average, indicates some failure in the organism, or some unusual influence. A temperature of 104 degrees is a high fever, and if continued may cause death.

The minutest tissue in the body is a source of heat in proportion to the activity of its chemical changes. The more active the changes, the greater the heat produced, and the greater the amount of urea, carbon dioxid, and water eliminated. Oxidation is therefore the essential process of life; when it ceases for an instant life ends.

The waste caused by oxidation must be continually made good by a due supply of *proper* food to be built up into protoplasmic material. For the production of heat, therefore, food is necessary. But the proper amount of the right kind of food is necessary, when more food is taken than can be perfectly oxidized, the trouble begins.

There is hardly no malady so common among civilized people as chronic constipation. This is a natural result of neglect of bodily exercise, and of errors in diet, and in

women also of wrong habits of dress. Head-aches, mental cloudiness, insomnia, irritability, nervousness, depression of spirits, indecision of mind, loss of appetite, and lack of energy are among the minor evils growing out of this condition. More serious conditions, often the result of constipation, are rectal abscess, fissure and fistula, hemorrhoids, catarrh of the bowels and even cancer of the rectum.

Again, constipation leads to systemic poisoning arising from the absorption of putrefying matters retained in the intestines, and which is manifested in diseases of the liver, various forms of degradation of the nerves leading to neurasthenia or nervous prostration, arteriosclerosis, or hardening of the arteries, in fact, to torpidity of intestinal action may be traced, directly or indirectly, the larger half of the so-called diseases from which we suffer. Purgatives of all sorts, irritate the stomach and intestines, producing indigestion and intestinal catarrh. In fact many of the worst cases of constipation are made so by the regular use of cathartics, particularly the various pills so largely advertised. A cathartic acts by sudden-

ly drawing moisture from the mucous lining of the bowels. This frequently repeated exhausts the supply of secretion and the parts become dryer than ever.

The too sparing use of fluids. Water plays an indispensable part in both the environment and the internal chemistry of life. It forms more than half of the weight of most living things, and all the actively living parts of animals, and plants consist of water. The nuclei and protoplasm of cells consist of water holding the other ingredients in solution or suspension.

The human body contains about seventy-three per cent. of water, and the average man requires at least from three to six pints of the liquid per day to maintain the vital processes of health, this in addition to the twenty-five per cent. of water taken into the system as an ingredient of the food consumed. Water maintains the proper bulk to both blood and tissues, rendering them mobile and soft instead of dry and hard. When water is taken into the system, it assists in building up the organs and repairing them when worn out. Cell life could

not go on, and waste material could not be carried from the body without a certain amount of water taken every day. Drinking water should always be distilled or boiled before used. Filters and strainers are not only valueless, as they are simply filth and germ catchers, not destroyers; but are often so porous as to admit the passage of disease-breeding organisms. Perfectly pure water does not exist in nature. Water that contains much lime and magnesia is called hard water, and conveys to the blood substances which interfere with the most perfect action of the organs of the body. Spring and well water is always hard, on account of the mineral salts of the earth, such as lime, magnesia, potash, and soda.

Nothing takes the place of pure water. The constant use of beer every day gives the system no recuperation but steadily lowers the vital capacity. A slight injury, a severe cold, or a shock to the body or mind will commonly provoke acute disease, ending fatally. The use of beer produces a species of degeneration of all the organs, and local inflammation of both liver and kidneys. As we have already shown, alco-

hol is very injurious. Its apparently stimulating effect is fraudulent, being only the lash that exhausts all the sooner, and utterly fails to renew. The most startling problem connected with the use of alcohol is, that not only does it seriously affect the health, morals, and intelligence of the offspring of its votaries, but they also inherit the fatal tendency, and feel a craving for the very beverages which have acted as poisons on their systems from the commencement of their being. A drunkard is very rarely cured of his propensity whose tendencies to drink were derived from the hereditary predisposition given him by his parents.

In many patent medicines which are largely consumed throughout the country, by all classes of people, there is a percentage of alcohol which puts them on a level with rum and whisky as intoxicants. It is safe to affirm that they are medicines in name only. Their chief value lies in their alcoholic effect as a stimulant while the person is under the influence of them. They are used largely by persons not in the habit of drinking liquors, and the little dose taken three or four times a day is as stimulat-

ing to these people as his regular "finger" of "bitters" is to the regular liquor-drinker. Many a drunkard can date their downfall to the use of patent medicines.

Correct breathing is as necessary to the health of the pelvic and abdominal viscera as to the healthy condition of the lungs. Where the waist is constricted by a corset or tight bands the respiration is crippled, and the breathing is almost entirely from the upper part of the chest. When an increased supply of air is demanded from any over-exertion, by singing or active muscular exercise, the abnormal force is largely expended upon the organs of the pelvis, which are forced out of position, thus laying the foundation for chronic displacement.

If a person is unable to breathe properly, the blood is not thoroughly aerated in the lungs, and in passing through the blood vessels, especially their capillaries, it fails to be thoroughly purified and vitalized, and a congestion is very liable to be caused in some part or organ of the body. The liver particularly is liable to be congested, the portal circulation becomes loaded, the bowels obstructed, the kidneys over-taxed

and congested (they try to do the eliminative work of the liver), and the labor of the heart is immeasurably increased. The injurious pressure of the corset on the lower ribs and the abdominal viscera also interferes with digestion and assimilation, and produce dilatation of the stomach and gastric ulceration, and subsequent anæmia. The constriction and compression caused by corsets often gives rise to a great variety of nervous symptoms—headaches, back-aches, languor, hysteria, inactivity of the bowels, and depression of spirits. In post-mortem examination it is very common to find what is called a corset-liver, one in which there are great depressions and ridges from the pressure of the ribs upon the liver. The present mode of dress of women is actually a serious and destructive evil, and physicians condemn not only the corset and tight skirt bands, but also the practice which prevails of hanging the skirts from the hips.

Owing to their habits of dress, women cannot take that amount of physical exercise which is conducive to good health. Physical exercise is of the utmost importance to every one who



desires good health. In fact it is absolutely necessary, as muscular exercise creates a genuine demand for both food and oxygen. No matter how much oxygen is introduced into the system, no more will be used than that for which a previous demand has been made. The red corpuscles of the blood are oxygen bearers, and when these are diminished in quality, anæmia is the result, and every organ in the body is weakened; the circulation becomes sluggish and prone to stagnation; the muscles are lacking in nutrition and power, and the nervous action is weak and irregular.

There is nothing of more importance than the matter of proper nourishment for young children. A child's appetite should not be coaxed, neither should a tonic be given to create.

Fresh fruit will generally correct this trouble. Under-feeding and improper foods may stunt the growth of the body permanently during the period of childhood and youth, and over-feeding, especially if stimulating foods be given, may render its growth excessive but unnatural. Through the over-indulgence of the

mother how many children maintain good health, when their lunch baskets are supplied with cake, pastry, jelly, pickles, hard-boiled eggs, ham and tongue sandwiches, tarts—white, flaky and lardy?

Owing to the strenuous work required by our modern educational methods, children require sound bodies, healthy brains and quiet nerves. The effect of too frequent indulgences of children in improper food during the period when the digestive organs are undergoing evolution and are most susceptible to injury is undoubtedly a prolific cause of digestive trouble in after life. The tens of thousands of improperly nourished children, and the failing health of other members of the family, can only too often be laid to badly cooked food and smothered with seasonings.

During the period of childhood, the diet should contain a greater proportion of nitrogenous food, as this supplies muscular force, and demands upon the muscular system increase with the increasing age of the patient. A child is storing up materials for fresh growth and for future needs, while the adult is using up

and renewing the materials of which the body is composed. For this reason proteids, mineral elements, fat, and carbohydrates are required in relatively much larger proportions in a child than in an adult. They require more food containing earthy salts for the growth of bone; of fats, which are essential for cell growth in a child; and of carbohydrates, which may be largely dispensed with in an adult, but in a child are absolutely necessary to meet the large demand for heat and energy, and thus to protect and shield from oxidation the proteids and fats that these may be stored for future needs.

For growing children the vegetable proteids are more valuable than the animal proteids for the construction and repair of the body, as the over-stimulation from the use of meat interferes with the laying on of flesh. Meat also, by its stimulating effect, produces a habit as surely as does alcohol, tea, or coffee, and a distaste for less satisfying foods, especially those containing mineral constituents which are so essential to bodily nutrition and health, and

without which the process of flesh growth and development are stunted.

Children in whom meat is a large factor in their diet have not the robustness and vigor, the freedom from attacks of ill-health, witnessed in those who have meat but sparingly. Says Dr. Winters, Professor of the Diseases of Children in the Cornell University Medical College: "The evil fruit, the pathological consequence of this unphysiological and abnormal feeding is to over-stimulate the delicate nervous organization, with undeveloped controlling centers and almost completely developed sympathetic nerves; to tax the system with incompletely burned, merely charred, excretory products; to render the urine, which in the young child is normally highly acid, abnormally so; and in its train, incontinence of urine, rheumatism, chorea, rheumatic tonsillitis and torticollis, night terrors, urticaria, angio-neurotic, œdema, and finally, from poisonous excrementitious products, anæmia, acute convulsions, and petit mal.

"There is more so-called nervousness, anæmia, rheumatism, valvular disease of the

heart, and chorera, at the present time, in children from an excess of meat and its preparation in the diet than from all other causes combined.

“Physiology and physiological chemistry make it unquestionably clear that meat should not be given in early childhood. Experience demonstrates and proves the accuracy and the value of physiological teaching.

“The ever-active, muscle-laboring, growing child, with its rapid heat loss, should have an abundance of cereals, vegetables, and milk in its diet, to meet physiological requirements.

“Children in whom meat is a large factor in their diet have not the robustness and vigor, the freedom from attacks of ill-health, witnessed in those who have meat but sparingly. A disproportion of animal food in the diet of a child, by over-stimulation of metabolism, leads to imperfect tissue-nutrition, delicacy of constitution, and irritability and peevishment of disposition; the resisting powers of the organisms are impaired; the susceptibility to disease heightened.”

If hygienic laws were obeyed in parents and

children, we should find the sons and daughters stronger, more enduring, better able to combat disease, and longer lived than their fathers and mothers. The opposite of this is the case, however, and things are getting worse instead of better. People should learn that health is a process of natural growth; disease a process of abnormal growth. Health is healthful action in response to healthful conditions; disease is unhealthful action due to unhealthful conditions. The effect of disease may be for a third generation, but the laws of health are for a thousand.

## APPENDIX II.

### NUTRITIVE VALUE OF ANIMAL AND VEGETABLE FOOD.

#### VEGETABLE.

In 100 Parts.	Carbo- hydrates.	Proteids.	Hydro- carbons.	Saline.	Water.
Beans .....	55.86	30.8	2.0	3.65	8.40
White haricots.....	55.7	25.6	2.8	3.2	9.9
Dried peas.....	58.7	23.8	2.1	2.1	8.3
Lentils .....	56.0	25.2	0.6	2.3	11.15
Dry southern wheat.....	67.112	22.75	2.61	3.02	
Dry common wheat.....	77.05	15.25	1.95	2.75	
Oatmeal .....	63.8	16.6	5.6	3.0	0.50
Barley meal.....	74.3	6.3	2.4	2.0	15.0
Rye meal .....	73.2	8.0	2.0	1.8	15.0
Dry maize.....	71.55	12.50	8.80	1.25	
Dry rice.....	89.65	7.55	0.80	0.90	
Buckwheat .....	64.90	13.10	3.0	2.50	13.0
Dried figs.....	65.9	6.1	0.9	2.3	17.5
Dates.....	65.3	6.6	0.2	1.6	20.8
Bananas .....	19.0	4.82	0.632	0.701	73.9
Walnuts .....	8.9	12.5	31.6	1.7	44.5
Filberts.....	11.1	8.4	28.5	1.5	48.0
Peanuts ...	11.7	24.5	50.0	1.8	7.5
Cocanuts.....	42.7	5.5	35.0	1.10	46.6
Chestnuts .....	42.7	3.0	2.5	1.8	40.2
Locust beans.....	67.9	7.1	1.1	2.0	14.6
Cocoa nibs, chocolate....	11.10	21.20	50.0	3.0	12.0

## ANIMAL PRODUCTS.

In 100 Parts.	Proteids.	Hydro-carbons.	Saline.	Water.
White of egg.....	20.4	.....	1.6	78.0
Yolk of egg.....	16.0	30.7	1.3	52.0
Cow's milk (lactine, 5.2).	4.1	3.9	0.8	86.0
Cream (lactine, 28).....	2.7	26.7	1.8	66.0
Butter.....	.....	83.0	2.0	15.0
Gruyere cheese.....	31.5	24.0	3.0	40.0
Roquefort cheese.....	26.52	30.14	5.7	34.55
Dutch cheese.....	29.43	27.54	.....	36.10
Chester cheese.....	25.99	26.34	4.6	35.92
Parmesan cheese.....	44.08	15.95	5.72	27.56
Cheddar cheese.....	28.4	31.1	4.5	36.0

## FLESH FOODS.

Lean beef.....	19.3	3.6	5.1	72.0
Fat beef.....	14.8	29.8	4.4	51.0
Lean mutton.....	18.3	4.9	4.8	72.0
Fat mutton.....	12.4	31.1	3.5	53.0
Veal.....	16.5	15.8	4.7	63.0
Fat pork.....	9.8	48.9	2.3	39.0
Dried ham.....	8.8	73.3	2.9	15.0
Tripe.....	13.2	16.4	2.4	68.0
White fish.....	18.1	2.9	1.0	78.0
Red fish (salmon).....	16.1	5.5	1.4	77.0
Oysters.....	14.01	1.51	52.69	80.385
Mussels.....	11.72	2.42	2.73	75.74



# INDEX.

---

- Alcohol, 56, 162.  
Altitudes, High, 72, 105, 107.  
Animal Food, Nutritive value of, 171.  
Animals, Susceptibility to disease, 24.  
  
Bathing, 127.  
Beer, 161.  
Benzoin, Compound Tincture of, 55.  
Bergeon's treatment, 53.  
Body, Inherent powers of, 61, 143.  
Bovine tuberculosis, 23.  
Breathe properly, How to, 69, 163.  
  
Cacodylic acid, 50.  
Carbohydrates, 80.  
Carbonic acid gas, 53.  
Chapman, Dr. Nathan, quoted, 42.  
Children of tuberculous mothers, 95.  
Children, Meat diet for, 165.  
Cinnamic acid, 50.  
Climate, change of, 101.  
Cod-liver oil, 47.  
Colds, 35,  
Constipation, 158.  
Consumption—  
    a communicable disease, 31.  
    causes of, 17, 25, 27.

## Consumption (Continued)—

climatic treatment of, 101.

cough of, 130.

curability of, 39.

described, 11.

diet of, 75.

duration of, 37.

early diagnosis of, 36, 59.

exercise in, 72, 96.

expense of, 15.

germ of, 18.

hemorrhage of, 133.

how contracted, 21, 22.

hygienic treatment of, 122.

in ancient times, 12.

not inherited, 29.

not necessarily fatal, 40.

open-air treatment, 63.

physical signs of, 35.

post-mortem examinations, 14.

prevention of, 60, 137.

prophylactic treatment of, 122.

sanatorium treatment of, 111.

statistics of, 12, 14.

symptoms of, 33.

temperature of, 98.

treatment of, with drugs, 42, 57.

X-rays in, 36.

Cookery, Modern, 146.

Corsets, 164.

Cough mixtures injurious, 129.

Creosote, 49.

Diagnosis of consumption, 36-39.

Diet of consumptives, 75.

Digestion, Necessity of good, 76, 148.

- Drug treatment useless, 46, 57.  
Dust, Dangers of, 20.  
Exercise, 72, 96.  
Fats, The use of, 80.  
Flick, Dr. L. F., quoted, 115.  
Flint, Prof. Austin, quoted, 42.  
Food for children, 165.  
Food, Oxidation of, 157.  
Food, Proper amount of, 155.  
Food values, 84.  
Foods, What to avoid, 151.  
Fresh air, Necessity of, 61.  
Fruits, 82.  
Fussell, Prof. M. Howard, quoted, 38.  
Hemorrhage, 34, 134.  
Heredity, 28.  
Hereditary predisposition, 29.  
Hypophosphites, 48.  
Inhalations, 55.  
Kellogg, Dr. J. H., quoted, 141.  
Knoff, Dr. S. A., quoted, 90.  
Koch's discovery, 18, 52.  
Latham, Dr., quoted, 132.  
Loomis Sanatorium, 117.  
Lucas, Dr., quoted, 92.  
Marriage of consumptives, 31.  
Massachusetts Sanatorium, 87, 112, 117.  
Microscope, Value of, 38, 39.  
Milk diet, 94.  
Nordeach Sanatorium, 86.

- Osler, Prof., quoted, 28.  
Oxygen treatment, 54.  
Oxygen, Necessity of, 63.  
  
Pastries objectionable, 83, 147, 149.  
Patent medicines, 44.  
Pies, 150.  
Pork, 150, 152.  
Potatoes, 151.  
Predisposition to disease, 30.  
Proteid foods, 80.  
  
Quacks and quackery, 43.  
Rosen, Dr. Richard, quoted, 32.  
  
Sanitation, 25, 138.  
Sanatoriums, 112.  
Secret remedies, 44.  
Serum treatment, 50.  
Sharon Sanatorium, 119.  
Swett, Dr. John, quoted, 43.  
  
Temperature, 34.  
Tubercle bacilli, 18.  
Tubercular infection, Resistance to, 24.  
Tuberculin, 35, 52.  
  
Vegetable Food, Nutritive value of, 171.  
Vegetables, 82.  
Ventilation, 66.  
Vital resistance, 25, 143.  
  
Water drinking, 160.  
Webster, Dr. George W., quoted, 122.  
Wheat flour, 148.  
White, Dr. Ernest W., quoted, 143.  
White Haven Sanatorium, 112.



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